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ABSTRACT

Four Proficiency Examinations for Clinical Laboratory Personnel were developed in Clinical Chemistry, Microbiology, Hematology, and Blood Banking. Purpose of project was to enable competent military laboratory technicians who lack credentials to demonstrate their job-related skills and knowledge for civilian positions, and also to help civilians trained on the job to advance. The examinations were constructed by laboratory experts and administered to more than 4,000 persons. Normative data have been compiled. Test scores are used by employers to place and promote laboratory workers. Some credentialing agencies are using or considering use of the examinations. Special use of the tests, including evaluating needs for continuing education, are being developed. The examinations have paved the way for development of equivalency examinations for academic credit, and for other proficiency examinations in nearly all allied health fields. Future needs include updating the examinations to meet rapid changes in the field, publicizing future administration of the examinations, and a study to compare job performance with test scores to prove the job-relationship of the examinations under mandates of equal employment opportunity regulations. (Author)

ED 097381

A CHANCE TO GET AHEAD

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Proficiency Examinations for Clinical Laboratory Personnel

FINAL REPORT

July 1, 1970, to January 31, 1974

By Jean D. Linehan

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Submitted to Howard Rosen, Director, and William Throckmorton, Project Officer, Office of Research and Development, Manpower Administration.

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The National Committee for Careers in the Medical Laboratory, sponsored by the American Society of Clinical Pathologists and the College of American Pathologists, was founded in 1953 to promote recruitment and strengthen educational programs for medical laboratory personnel. The Committee has carried out an extensive program of research studies and demonstration projects, production of printed and audio-visual materials, and development of recruitment and scholarship programs.

The Committee's work in recent years has focused on career mobility in the laboratory field, including: a 1967 conference on "Manpower for the Medical Laboratory," bringing together persons from government and the professions to consider problems of recruitment, education, and utilization of laboratory personnel; publication of "Equivalency and Proficiency Testing Related to the Medical Laboratory Field"; development of Proficiency Examinations for job placement; promotion of Equivalency Examinations for academic credit; and preparation and utilization of audio-visual materials for training and upgrading.

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The National Committee for Careers in the Medical Laboratory and this Proficiency Examinations Project owe much to Thomas M. Peery, M.D., who in his 1969 address as President of the American Society of Clinical Pathologists advanced the idea of a true career ladder for clinical laboratory personnel, and who as NCCML's Chairman from 1970 through 1973 led the Committee's efforts to achieve this goal.

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Highlights

- Four Proficiency Examinations for Clinical Laboratory Personnel – in Clinical Chemistry, Microbiology, Hematology, and Blood Banking – have been developed by the National Committee for Careers in the Medical Laboratory, working with Educational Testing Service, under a contract with the Manpower Administration of the Department of Labor.

- Purpose of the project was to break down barriers to employment and upgrading of competent medical laboratory technicians who lack credentials, by enabling them to demonstrate their job-related skills and knowledge. Both military laboratory specialists seeking civilian laboratory careers and civilians trained on the job who seek advancement can benefit.

- The Proficiency Examinations were constructed by laboratory experts and are now administered on a regular basis by Educational Testing Service at test centers across the country and military bases throughout the world. More than 4,000 laboratory workers have taken them.

- Normative data have been compiled showing the scores of a representative group of hundreds of laboratory technicians who have taken the Examinations.

- Test scores are being used by employers to place and promote laboratory workers. By enabling employers to hire ex-corpsmen, for example, at better than entry level, the Examinations help retain trained and experienced workers for the laboratory field.

- Some credentialing agencies are using or considering use of the Examinations. Special use of the tests, including evaluating needs for continuing education, are being developed.

- A companion set of Equivalency Examinations for academic credit in the same four laboratory areas has been developed concurrently with the Proficiency Examinations by Educational Testing Service, and has been promoted by NCCML.

- The Examinations have paved the way for development of other proficiency examinations in nearly all the allied health fields. Such projects are now underway in the Department of Health, Education, and Welfare, mandated by Congress in P.L. 92-603.

Background

Many factors converged to prompt the undertaking of this project by the National Committee for Careers in the Medical Laboratory, the Educational Testing Service, and the Manpower Administration in July of 1970:

- Projected shortages of medical laboratory personnel stemming from greater demands for laboratory services as the result of population increases, new technologies, and greater utilization of medical care facilities through Medicare, Medicaid and health insurance coverage.
- The need for a mechanism to measure the abilities of uncredentialed medical laboratory workers who have learned on the job or in unaccredited training programs, to qualify them for work on Medicare and other assignments.
- Federal government interest in facilitating transfer of military-trained health manpower to the civilian health field, so as not to lose the value of their training and experience.
- Readiness of the medical laboratory field for development of proficiency examinations, as recommended at the National Conference on Manpower for the Medical Laboratory in 1967 and in the study of "Equivalency and Proficiency Testing Related to the Medical Laboratory Field" completed early in 1970, and affirmed by pathologists at a 1970 meeting called by HEW to discuss barriers to utilization of laboratory workers.
- The opportunity for tandem development of proficiency examinations at the same time as a project for equivalency examinations was begun for the HEW Division of Allied Health Manpower.

Shortages

In the decade from 1965 to 1975, according to a Labor Department estimate, an increase from 100,000 to 160,000 medical laboratory workers would be required just to keep up with laboratory tests being done at the beginning of that period. The Public Health Service projected similar needs. The Tennessee Hospital Association said in January 1970 their survey indicated the need for laboratory technicians would more than triple in the next three years.

Certifiable laboratory education falls far short of filling the nation's needs. Even if they were full to capacity, the schools could barely keep up with normal attrition, let alone meet the projected need.

Improving Utilization

Leaders in the medical laboratory field recognized that better use of workers already employed would be at least part of the solution to the impending manpower shortage. Better utilization would entail establishing a career ladder and making available new opportunities for upward mobility through recognition of knowledge and skills gained outside of formal education.

Among the under-utilized: (1) the 1,700 *military-trained laboratory specialists* being separated from the Armed Forces each year, the majority of whom did not transfer their training and skills to the civilian laboratory field, and (2) the many thousands of *lower-level civilian employees*, most of them trained on the job, with no officially-recognized certification or status in the field, regardless of their actual qualifications. But there was no way to evaluate the real qualifications of either group.

The National Committee for Careers in the Medical Laboratory* was well aware of the needs and problems in the field. In 1967, the Committee had sponsored with the Public Health Service a conference on "Manpower for the Medical Laboratory," bringing together representatives of government and the professions to consider

*Until Fall 1970, the National Committee for Careers in Medical Technology. Reference in this report is to NCCML, for the sake of simplicity.

> • Specific efforts should be aimed at recruiting armed service veterans who received training in military laboratory programs .... Low salaries and lack of prestige at the levels for which they qualified have deterred veterans from seeking civilian laboratory jobs ....
>
> • ... The recognition of knowledge gained outside of formal education to fulfill academic and clinical requirements would give persons with initiative and ability opportunities for advancement.
>
> —Recommendations, Conference on Manpower for the Medical Laboratory (1967)

problems of recruitment, education and utilization of medical laboratory personnel. The conference recommended the recruitment of military-trained laboratory specialists for civilian jobs, and noted that recognition of knowledge gained outside of formal education "would give persons with initiative and ability opportunities for advancement." It suggested that examinations should be developed to provide increased mobility between levels and categories of laboratory careers.

Equivalency and Proficiency Tests

Following up on the conference recommendation, NCCML initiated with the support of the HEW Division of Allied Health Manpower a year-long study of the "state of the art" of equivalency and proficiency testing – and its possible uses in the medical laboratory field. The report of that study, "Equivalency and Proficiency Testing Related to the Medical Laboratory Field," issued in March 1970, defined terms, summarized current testing practices in the allied health fields, and identified a need and considerable support for development of tests to evaluate the skills and knowledge of laboratory workers.

Equivalency examinations, the report noted, are designed to provide academic credit for off-campus learning. At the time of the study, the College-Level Examination Program (CLEP) of the College Entrance Examination Board was beginning to offer a national credit-by-examination opportunity, following the lines of a new examination program offered by the State of New York. An idea begun by the University of Illinois in 1895, and fostered by many individual colleges, was becoming a national movement, providing a way for persons to demonstrate learning achieved through means other than on-campus courses.

Proficiency examinations* measure the skills and knowledge necessary to perform at a certain job level – an assessment of job capabilities. The study found that historically there had been very little activity in this area, although considerable interest was developing.

Federal Pressures

The NCCML study came to the attention of Congress. The House Ways and Means Committee was then looking into Medicare's personnel standards for independent laboratories. Concluding that a heavy reliance on certification by professional organizations "has served to prevent experienced people either from entering the clinical laboratory field altogether or from making this their career – moving from a lower skilled job to a higher skilled one," the Committee's May 1970 report on the Social Security Amendments of 1970 echoed the NCCML study:

> ... Both recruitment and utilization of laboratory personnel would be greatly enhanced by the use of equivalency and proficiency examinations. The use of such examinations would greatly increase career mobility in the laboratory field, thereby making the profession more attractive generally, facilitating the recruitment and retention of laboratory workers, and encouraging re-entry into the field by those who left it.

That same year, the Health Training Improvement Act of 1970 (P.L. 91-519) authorized HEW in its programs for allied health manpower to develop techniques for "appropriate recognition (including equivalency and proficiency testing mechanisms) of previously acquired training or experience."

The Congressional interest in alternate means of qualifying personnel under Medicare regulations culminated many months later in the requirement in the Social Security Amendments of 1972 (P.L. 92-603) that Medicare develop and use proficiency examinations for all the many allied health occupations covered by its personnel standards.

There was also considerable Federal interest in utilizing the skills of separating medical corpsmen. HEW

*Not to be confused with "proficiency testing" – a quality control procedure by agencies in the laboratory field, evaluating performance of a laboratory as a whole, not of individual workers.

and the Department of Defense, following earlier experience with Project REMED, had recently formed a joint project called "MEDIHC" – Military Experience Directed Into Health Careers – through which separating corpsmen would be identified and then counseled on opportunities for jobs and/or further training in civilian health fields.

Two studies gave some impetus to that project. Colonel James J. Young sampled the backgrounds and opinions of some 1,500 men representative of the 21,000 medical corpsmen released to the Army Reserve in 1968. He found most of them were highly satisfied with their health occupations training and experience in the military, but few of them went into civilian health occupations when they returned from the service. The major reason: lack of status and recognition for military training and experience. More than 80% said they would gladly take an equivalency examination to get credit for their military training and experience so as to complete their education in less time. Almost as many said they would like to take an examination for job placement.

At the same time, Robert R. Nathan Associates were completing a study for the Manpower Administration on "Transferability of Military-Trained Medical Personnel to the Civilian Sector," documenting further the fact that such corpsmen represent a rich source of civilian health personnel, "if they can be provided opportunities for training, employment and advancement commensurate with their education."

Military Laboratory Specialists

In the years just before 1970, the number of military laboratory personnel separated each year equalled the number going through training courses to replace them. Nearly 1,700 servicemen were receiving that laboratory training each year, as follows :

Service	Short Courses (12-17 weeks)	Long Courses (Approximately 1 year)
Army	930	125
Navy	120	160
Air Force	175	183
	1,225	468

There was no way to equate military laboratory training and experience with the standards of the civilian laboratory field. While the curricula of military laboratory courses are available, the experiences of military laboratory specialists after their initial training vary considerably. One may spend many months in a comprehensive hospital laboratory performing complex

> With these Examinations, which test the ability of a laboratory technician to do the job, the way is open for qualified but now ineligible veterans returning from such duty overseas to use their skills in the civilian economy. Let's hope that Medicare can put them to good use.
>
> –WILBUR D. MILLS, Chairman, Committee on Ways and Means, U.S. House of Representatives (1974)

specialty determinations under the skilled direction of pathologists and clinical scientists; another may be assigned aboard a small ship where he is likely to perform only the most routine procedures. No system exists for detailed documentation of this experience.

Entry for military laboratory specialists to professional certification by the Board of Registry of Medical Technologists of the American Society of Clinical Pathologists was limited. A corpsman with a baccalaureate degree including the requisite hours of chemistry and biology could be eligible for the Medical Technologist certifying examination after five years of experience. Two years of college plus a year-long military laboratory course qualified a candidate for the Medical Laboratory Technician examination. For those veterans without at least two years of college, the only option was certification as a Certified Laboratory Assistant – a level with status and pay not usually attractive to former corpsmen, and not at all appropriate for a 20-year veteran who may have supervised the work of a military laboratory.

The result was that former corpsmen often refused to consider an inappropriate entry-level job in a civilian laboratory – and all their valuable training and experience was lost to the health field.

Despite Federal interest in using medical corpsmen's skills, a military laboratory specialist could not transfer even into equivalent civilian government work, since U.S. Civil Service regulations require formal educational background. No procedures exist in either Federal or state civil service systems for laboratory workers to proceed from the technician level to the professional technologist level without formal academic study.

> A logical extension of the credit-by-examination concept must be conceived, developed, and fostered for the allied health professions. This is already being interpreted as one of the major needs if the mobility concept is to be achieved . . . . Based upon effective measurement devices of such proficiency or equivalency levels, it would not be necessary for an individual to begin at the very lowest level or rung of a ladder in an allied health field, but rather one could be admitted into an educational program or level of clinical functioning based upon his measured capabilities.
>
> —J. WARREN PERRY, President Association of Schools of Allied Health Professions (1969)

> Credentialing . . . acts as a barrier to career development for substantial numbers of persons, many of whom are presumed to be competent in their field. The hanging of credentialing upon possession of a college degree, so common in the health field, is merely a reflection of the fact that the determination of what constitutes proficiency in a health occupation is extremely complex and difficult. The Manpower Administration of the Department of Labor has given substantial impetus to this task through their funding of the development of proficiency examinations in clinical laboratory fields.
>
> —THOMAS D. HATCH, Director, HEW Division of Allied Health Manpower (1972)

The various interests in equivalency and proficiency examinations for the medical laboratory field coalesced at a meeting of government officials and leading pathologists, called on behalf of Roger O. Egeberg, M.D., then HEW Assistant Secretary for Health and Scientific Affairs, in April 1970, and attended by representatives of HEW, Labor, Defense, and the Veterans Administration. Those participating agreed that both types of examinations were needed to help solve the manpower problems of the medical laboratories. And the pathologists, as the main employers of medical laboratory personnel, agreed to assist in the development of proficiency examinations and assured the government officials they would use the tests in screening discharged military laboratory corpsmen as well as civilian on-the-job trainees for appropriate positions.

HEW's Division of Allied Health Manpower was preparing to fund development of a battery of equivalency examinations for academic credit in the medical laboratory field — a project initiated and stimulated by NCCML in the course of its study. The tests would be developed by Educational Testing Service of Princeton, N.J., for the College-Level Examination Program.

With this background, NCCML proposed that the Labor Department's Manpower Administration fund a parallel project to develop a series of proficiency examinations for job placement, also using the test development services of Educational Testing Service. The expectations were that tandem development of the two sets of tests would permit coordination, eliminate duplication and reduce costs. Their use could also be promoted simultaneously.

In addition, the Labor Department hoped to demonstrate the usefulness of proficiency examinations in helping to eliminate artificial barriers to jobs for people qualified to perform. The applicability of the technique throughout the occupational structure was evident.

Both projects were looked on as possible models for other allied health occupations. These other fields were feeling the same pinch of present and projected shortages of personnel, were experiencing the same desires for career mobility, were looking at the returning medical corpsmen with the same interest, and were ripe to consider the possibilities of proficiency and equivalency examinations. There could be no assurance that other health fields would make immediate use of the projects as guides to solving their own career mobility problems, but the experiences would undoubtedly be useful in stimulating interest as well as demonstrating an approach to the solution.

The Contract

On June 30, 1970, Contract No. 82-22-70-35 was signed by the Department of Labor and the National Committee for Careers in the Medical Laboratory.

As an MDTA "Experimental and Demonstration Project," the contract was awarded by the Manpower Administration's Office of Research and Development, directed by Howard Rosen, with Seymour Brandwein as associate director. William Throckmorton was designated project officer.

The 12-month $199,124 contract called for NCCML "to develop proficiency examinations as a means of aiding placement and promotion of proficient workers who lack formal credentials."

Some of the details were spelled out:

- An interdisciplinary Advisory Committee would guide the project;
- Test construction would be subcontracted to Educational Testing Service;
- Tests would be developed in four laboratory subject areas;
- Standard scores of working laboratory technicians would be obtained; and
- NCCML would publicize and promote both proficiency and equivalency examinations.

Many other details for implementation were left to be decided, in keeping with the experimental nature of the project.

The contract was extended with some accompanying increases in the budget, to take advantage of NCCML's findings and to use its capabilities in disseminating information on this innovation throughout the medical laboratory field. In addition NCCML was asked to follow up its efforts at implementation, as described in the section of this report on utilization.

Of the total $358,250 budget for the entire 43-month project, $205,800 was subcontracted to ETS.

The significance of the health field and the potential for work with medical lab workers influencing other health occupations, the potential value of wider recognition of the idea of using proficiency measurement as an alternative to academic credentialing, and the resourceful past work by this sponsor for DOL and HEW, have led to the judgment that we should underwrite this particular project.

—HOWARD ROSEN, Manpower Administration, Department of Labor (1970)

Getting Underway

Although it was early summer when the Proficiency Examinations Project was launched, NCCML was able to assemble an outstanding interdisciplinary National Advisory Committee of eleven persons, and to bring them together for a meeting on July 28 with resource people and test development experts. Each member was chosen for what he or she could contribute to the Proficiency Examinations project, *not* as a representative of any professional organization. The chairman and several members of the Advisory Committee for the Equivalency Examinations project were included to provide correlation with that project.

The Advisory Committee was to meet three times during the project, providing group guidance as the effort began and progressed. Each member also gave valuable time and advice individually during the course of the project.

In addition, representatives of key agencies met with the Advisory Committee as resource persons, contributing greatly to the project.

The Advisory Committee members and resource persons are listed below*:

Advisory Committee:

Joe M. Blumberg, M.D., Major General, USA (Ret.), *Co-Chairman*–Director, Medical Education, Hunter Laboratory, Washington, DC

Mrs. Loula Woodcock, MT(ASCP), *Co-Chairman*–Chief Medical Technologist, Scripps Memorial Hospital, La Jolla, CA

Howard L. Bodily, Ph.D.–Brigham Young University, Provo, UT; formerly Chief, Laboratory Services, California State Health Department, Berkeley, CA

James L. Hansen, Colonel, MC, USA–Director, Armed Forces Institute of Pathology, Washington, DC

Clarence R. Jones, MLT(ASCP)–Executive Director, Cure Health Plan, Inc., Chicago, IL; formerly Administrative & Technical Assistant to the Pathologist, Faith Hospitals, St. Louis, MO

Harold I. Lewack–Manpower Analyst, Division of Program Development and Legislative Services, Manpower Administration, Department of Labor, Washington, DC (Deceased, 1971)

Robert S. Melville, Ph.D.–Chief, Chemical Sciences Section, Research Grants Branch, National Institute of General Medical Sciences, Bethesda, MD

A. Wendell Musser, M.D.–Assistant Chief Medical Director for Planning & Evaluation, Veterans Administration, Washington, DC (Chairman, Equivalency Examinations Advisory Committee)

John Peterson–Administrator, Valley Hospital, Ridgewood, NJ

Martha Phillips, M.S., MT(ASCP)–Chief, Allied Health Training, Veterans Administration, Washington , DC

Harvey I. Scudder, Ph.D.–Head, Division of Biological & Health Sciences, California State College, Hayward, CA (Member, Equivalency Examinations Advisory Committee)

Resource:

Lt. Col. Robert C. Barnum, USA–MEDIHC Coordinator, Transitional Manpower Program, Department of Defense, Washington, DC (to July 1971)

William R. Bishop, Ph.D.–Assistant Director, Department of Allied Medical Professions and Services, American Medical Association, Chicago, IL

Marion M. Brooke, Sc.D.–Chief, Laboratory Consultation and Development Section, Center for Disease Control, Atlanta, GA

Donald E. Brown, M.D.–Director of Laboratories, Hackensack Hospital, Hackensack, NJ (Chairman, ASCP Board of Registry; from October 1971)

E. Martin Egelston–Assistant Director, Bureau of Manpower and Education, American Hospital Association, Chicago, IL

Donald F. Foy–Director, Department of Health Manpower, American Medical Association, Chicago, IL

Robert M. Gertz–Director, Medical Technology Services, American Society of Clinical Pathologists, Chicago, IL

Karen Greene–Manpower Analyst, Office of Research and Development, Manpower Administration, Department of Labor, Washington, DC

*Titles are those held at that time.

David Hoover–Associate Director for Program Planning and Evaluation, Division of Allied Health Manpower, PHS, Bethesda, MD

Paul C. LeGolvan, M.D.–Assistant Director, Pathology and Allied Sciences Service, Veterans Administration, Washington, DC

Colin R. Macpherson, M.D.–Director, Division of Laboratory Medicine, Ohio State University Hospital, Columbus, OH (Chairman, Board of Schools)

Barbara C. Nagel–Public Health Advisor, Division of Medical Care Standards, Community Health Service, PHS, Rockville, MD

Lt. Col. Walter J. Seaman, USA–MEDIHC Coordinator, Transitional Manpower Program Department of Defense, Washington, DC (from July 1971)

Capt. Ouida Upchurch–Director, Education and Training Sciences, Naval Medical Research Institute, Bethesda, MD

George P. Vennart, M.D.–Professor of Clinical Pathology, Medical College of Virginia, Richmond, VA (Chairman, ASCP Board of Registry; to October 1971)

For those interested in career development for medical and health workers, "equivalency testing" and "proficiency testing" are magical words. They represent strategies for career development that are often discussed and much hoped for, but are somehow never there, like a mirage. Now, however, the mirage is turning into a reality, at least in one small corner of the vast field of health–the clinical laboratory.

–Comprehensive Health Services Career Development Technical Assistance Bulletin, National Institute for New Careers (1970)

Baseline Decisions

The Advisory Committee at its first meeting defined the scope of the project. Major decisions reached were these:

Name of the Project: Committee members recognized that "proficiency testing" in the laboratory field customarily refers to the sending of blind samples to laboratories for testing as a quality control check on the proficiency and accuracy of the laboratory as a whole, not of individual laboratory workers. Since the present project had no connection with this testing practice, there was bound to be confusion. Nonetheless, the word "proficiency" was already in use in the allied health field to refer to the type of tests to be developed by this project. No other equally descriptive term was suggested. Thus the name "Proficiency Examinations for Clinical Laboratory Personnel" was agreed to, recognizing there would be some attendant confusion to counteract. One method of counteracting that confusion has been to refer whenever possible during the course of the project to "proficiency examinations," rather than "proficiency tests." Another word received some scrutiny. Although "Medical Laboratory Personnel" had been NCCML's usual description of the population to be served, "Clinical Laboratory Personnel" was substituted to demonstrate the interdisciplinary nature of the project.

Proficiency and Equivalency: A source of more misunderstanding from outsiders throughout the project was to be the distinction between "Proficiency" and "Equivalency" examinations. With the expectation this would be the case, definitions were agreed on and included in the first Progress Report:

> *Equivalency Examinations* are used to equate non-formal learning with learning achieved in academic courses or educational programs. Such tests are designed to enable colleges and universities to grant academic credit for off-campus learning.
>
> *Proficiency Examinations* are used to measure an individual's competency to perform certain jobs at certain levels – a competency made up of knowledge and skills and related to the requirements of the specific job. Such tests are designed to enable employers to place workers at appropriate job levels, irrespective of their formal certifiable credentials.

Laboratory Fields: The Advisory Committee confirmed the proposed divisions of the laboratory field for the project, and directed that tests be developed in the following four areas, encompassing the greatest number of laboratory tests and procedures:

Clinical Chemistry
Microbiology
Hematology
Blood Banking

Job Level of Examinations: Tests were to be designed

to evaluate the job-related skills and knowledge of a laboratory technician – that is, a worker standing generally above a laboratory assistant and below the baccalaureate degree position of Medical Technologist. The tests were to have sufficient range to locate workers on a scale above and below the average technician. Thus they were to contain some difficult questions as well as some easy ones.

Type of Examination: The Advisory Committee considered the possibilities of requiring a demonstration of performance, since ability to perform is the key to proficiency in the clinical laboratory. Yet the historical difficulties with practical tests and recent progress made with paper-and-pencil tests led to the conclusion that the latter were preferable for this project. Observation of actual performance in a laboratory would not only increase the cost and problems of administering the examinations, but would reduce the objectivity of the results. Those for whom the examinations were to be designed, it was pointed out, have been working in laboratories; this fact alone would presume some practical competence. The Advisory Committee endorsed the premise that the examinations should be paper-and-pencil tests, simulating real conditions to the extent possible.

Examining Committees: Two major functions of the Advisory Committee were to develop guidelines for the naming of the four Examining Committees and to nominate their members. Each Committee was to consist of three to five laboratory experts, including in each case: (1) an M.D. skilled in the discipline under consideration, (2) a clinical scientist from the specialty, (3) someone from the military laboratory system, and (4) someone from an intermediate laboratory level, such as a Medical Technologist or Master Sergeant from the discipline involved. Finally, and most important, every Examining Committee member should be thoroughly familiar with the specialty under consideration. Potential Committee members were nominated.

Timetable: A rough time schedule for the project showed that if the Examining Committees began work immediately and test specifications were ready by September, test items could be approved by December, pretesting could occur in April, and the final tests would be ready for norming by the end of June. Another three months would be required for the norming administration and analysis of the results, with a report on the data due at the end of September. Further discussion during the year would bring out the possibilities for promoting the examinations and utilizing their results, it was agreed.

(We) encourage establishment of educational equivalency measures and job performance tests as alternative routes to licensure of health care personnel. The requirement that an employee with experience, interest, and capability for job advancement be classified the same as a new student or an inexperienced employee is not reasonable. Therefore, state statutory revisions that grant advanced educational or job placement to individuals possessing previous educational or work experience equivalent to that required in an accredited education program should be actively supported. Support also should be given to the development of equivalency measures and job performance tests by test-making agencies.

–Board of Trustees, American Hospital Association (1970)

Test Construction

In order to complete the project within the time limits imposed, the first two-day work sessions of the Examining Committees had to be scheduled for the last two weeks of August in Princeton, New Jersey. This was just two weeks away.

NCCML staff issued invitations by phone, and then in writing, to the nominees the Advisory Committee had named as potential Committee chairmen and members.

An early demonstration of the interest in the project's possibilities was the fact that 17 out of 18 laboratory experts invited to participate agreed to do so. Many changed other plans in order to come to Princeton; one Committee chairman interrupted his vacation for the initial meeting. The Examining Committee members were as follows:

Clinical Chemistry

Martin Rubin, Ph.D., Georgetown University Hospital, Washington, DC, *Chairman*
Mst. Sgt. James R. Brown, Medical Field Service School, Fort Sam Houston, TX
Howard Rawnsley, M.D., Hospital of the University of Pennsylvania Medical School, Philadelphia, PA
Loula Woodcock, MT(ASCP), Scripps Memorial Hospital, La Jolla, CA

Microbiology

Gerald Needham, Ph.D., Mayo Medical School, Rochester, MN, *Chairman*
Lt. Walter Cox, M.Sc. (USNR), National Naval Medical Center, Bethesda, MD
Sgt. John James, USAF Medical Center, Wright-Patterson AF Base, Dayton, OH
Jesse Marymount, M.D., Wesley Medical Center, Wichita, KS
Cornelia Van Bentham, M.A., MT(ASCP), Hackensack Hospital, Hackensack, NJ

Hematology

Robert Langdell, M.D., University of North Carolina Medical School, Chapel Hill, NC, *Chairman*
Major Joseph H. Keffer, M.D., Anderson Pathology Associates, Anderson, SC
Doris Mahon, Walter Reed Army Medical Center, Washington, DC
Gwendolyn N. Taylor, MT(ASCP), Medical University of South Carolina, Charleston, SC

Blood Banking

Lt. Col. Frank Camp, U.S. Army Medical Research Laboratory, Ft. Knox, KY, *Chairman*
Ralph Lingeman, M.D., Veterans Administration Hospital, Washington, DC
Grace Neitzer, MT(ASCP), Michigan Community Blood Center, Detroit, MI
Lt. Col. Harold Neuman, Malcolm Grow USAF Medical Center, Andrews AF Base, Washington, DC

Educational Testing Service

Although it was to be some months before the technicalities of the subcontract were spelled out, Educational Testing Service began immediately to expend its staff energies and its own funds on the project. Without this complete cooperation, the tight time schedule would have been impossible to meet.

Educational Testing Service work on the Proficiency Examinations has been coordinated by Jane L. Houis, program director in the Government and Career Programs Division. She has been assisted by Betty Kleiner and Linda Kellner, administrative assistants in the Division.

Test development in the Science Department of ETS has been the responsibility of Frank J. Fornoff, Ph.D., chairman and senior examiner of the Department; William Kastrinos, senior examiner; Susan Countess, assistant examiner; and Gertrude G. Sanders, assistant examiner.

Also present at some of the Examining Committee meetings were Robert J. Solomon, ETS executive vice president; Samuel Messick, vice president; Peter Loret, senior program director of the Government and Career Programs Division; and H. Eugene Kessler, assistant director of the Test Development Division.

Additional assistance in technical aspects of test development came from Jane Ellen Groth, head, pretest and item files; Betty Haven, senior statistical associate; Nancy Heath, senior programmer analyst; and Cheryl Reed, statistical associate.

Test Specifications

A major assumption had been made by the Advisory Committee that properly-constituted Examining Committees could come together in Princeton for two days and agree on the knowledge and skills, weighted for importance, to be expected of technicians performing successfully in each of the four areas of the clinical laboratory. There was no time and there were no funds for observation or recording and analysis of work processes.

Both the Advisory Committee and ETS were pleased with the results.

Each of the four Examining Committees developed a list of test specifications, including time, number of questions, difficulty, level of proficiency to be measured, test content (with percentages indicating weight to be given to the subject matter breakdowns), abilities to be measured, and types of items. These specifications were circulated to the Advisory Committee and then much more widely in a Progress Report to more than

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EXHIBIT A:

Test Specifications

CLINICAL CHEMISTRY

CONTENT

I. Equipment (5%)
   - A. Centrifugation; filtration
   - B. Pipettes, diluters
   - C. Balances
   - D. Glassware, volumetric

II. Instruments: principles of, ute of, and understanding of (20%)
   - A. Spectrophotometry and colorimetry (5%)
   - B. Flame photometry and atomic absorption (2%)
   - C. Automated equipment: auto-analyzers (5%)
   - D. Fluorimetry
   - E. Blood gases: ion-specific electrodes
   - F. Electrophoresis
   - G. Calculating devices: slide rule, machine, computers
   - H. Isotopic instruments: well counters
   - I. Osmometers
   - J. Chromatography

III. Chemical Principles and Applications (24%)
   - A. Calculation and measurements units (6%)
   - B. Identity and sources of biological specimens, specimen handling, preservation, collection (6%)
   - C. pH, solutions, buffers, water, normality, molarity, osmolarity (60%)

IV. Methodology (51%)
   - A. Enzymology (7%)
     1. For clinical applications (to be measured)
     2. For use as reagents (for measuring)
   - B. Proteins including cerebrospinal and other body fluids (5%)
     1. Measurement
     2. Fractionation
   - C. Other nitrogenous materials (5%)
     1. Urea
     2. Creatinine including clearance tests
     3. Amino acids
     4. Ammonia
     5. Uric acid
     6. Creatine
   - D. Lipids (3%)
     1. Cholesterol and other sterols
     2. Glycerides
     3. Fatty acids
     4. Lipoproteins
     5. Carotene
   - E. Carbohydrates including tolerance tests (7%)
     1. Glucose
     2. Xylose
     3. Galactose
   - F. Electrolytes, etc. (7%)
     1. Na, K, Cl, Ca, Mg, P, Fe
     2. Trace metals
     3. CO_2, pH
     4. Acid/base balance
     5. Nomogram
   - G. Endocrine procedures (3%)
     1. Thyroid function
     2. Adrenal (catechol amines, VMA, epinephrine, 5-HIAA)
   - H. Liver function (5%)
     1. Bilirubin
     2. BSP
   - I. Toxicology (3%)
     1. Salicylates
     2. Bromides
     3. Barbituates
     4. Ethanol
     5. Reinsch test for heavy metals
     6. Drugs (Li)
   - J. Urine chemistry (5%)
     1. Pigments
     2. Reducing materials
     3. Screening techniques: reagent papers
   - K. Other (gastric analysis, vitamins) (1%)

200 persons interested in the project. Reactions were uniformly favorable.

The general specifications were the same for all of the four tests. There were to be two forms of each test. Each was to be made up of 75 paper-and-pencil questions which would simulate practical conditions at the laboratory bench. The time for each was to be 60 minutes. The tests were all designed to measure the job-related skills and knowledge necessary for a laboratory technician, with enough range to locate workers somewhat above and below that level. Each of the Examining Committees therefore aimed to develop a test of considerable difficulty – so that the average candidate would score only about 50-60% correct answers.

Test content, the abilities to be measured, and the types of items varied for each of the tests. These are shown in Exhibit A.

Item Writing

Some 400 draft items (test questions) were needed in each field, to be winnowed eventually to 150 per field, since each of the two test forms was to have 75 items.

A three-way responsibility for writing the items was set up. Examining Committee members did a major part of the initial work, drafting some 25 items apiece.

ABILITIES

(As defined by Bloom's *Taxonomy of Educational Objectives*)
Knowledge: 25%
Application: 65%
Higher abilities: 10%
(including analysis, evaluation, synthesis)

ITEM TYPES

Principally, five-choice completion questions
Secondarily, classification sets and situational sets of questions

MICROBIOLOGY

CONTENT

I. Specimen and Culture Handling (10%)
  A. Collection of specimens (4%)
  B. Transportation (intra-and-extra) (3%)
  C. Record-keeping (0.5%)
  D. Storage (2%)
  E. Disposal and disinfection (0.5%)

II. Isolation and Identification (50%)
  A. Bacteriology (30%)
    1. Isolation from: (13%)
      a. urine
      b. blood
      c. stool
      d. nose and throat
      } (8%)
      e. other (tissue, spinal fluid, sputum, wound) (5%)
    2. Identification: (17%)
      a. Enterobacteriaceae (9%)
      b. Gram-positive cocci (5%)
      c. Others (anaerobes, Gran-negative cocci, Hemophilus) (3%)
  B. Parasitology (10%)
    1. Examination of:
      a. blood (2%)
      b. stool (7%)
      c. other (1%)
  C. Mycology (3%)
    1. Isolation
      a. Superficial
      b. Systemic
    2. Identification
  D. Mycrobacteriology (7%)
    1. Isolated from:
      a. contaminated areas
      b. sterile areas
      c. tissue
    2. Identification
      a. cultural
      b. biochemical

III. Serology (15%)
  A. Tests for disease identification (8%)
    1. Syphillis
    2. Mono
    3. Strep
    4. Febriles
    5. Cold Agglutinins
  B. Tests for organism identification (5%)
    1. Enterobacteriaceae
      a. Salmonella
      b. Shigella
      c. E. coli
    2. Positive Cocci
      a. Streptococcus
      b. Pneumococcus
  C. Pregnancy (1%)
  D. Miscellaneous (1%)
    1. Rheumatoid Arthritis
    2. Thyroid

IV. Antibiotic susceptibility by the standardized disc text (Kirby-Bauer) (5%)
  A. Media (0.5%)
  B. Innoculation (0.5%)

Outside item writers recommended by the Committee members came up with many more. For all items, ETS Science Department staff provided necessary editorial services.

Examining Committee members were given an orientation to question-writing at the August meetings. They wrote and reviewed various types of questions so as to become familiar with the procedures themselves and to prepare samples which would later guide the other item writers.

ETS staff members wrote to laboratory experts whose names had been suggested as potential item writers, and those who accepted the job (see Exhibit B) were sent instructional materials that had been reviewed by the Committee members. The materials explained the purposes of the project, outlined the test specifications, and showed samples of the types of questions to be drafted. Each item writer received a specific request for certain types of questions covering certain specific content areas.

Examining Committee members and outside item writers received honoraria for their work in developing the tests. One Committee member estimated she had spent the equivalent of five eight-hour working days at home on the task – not including the trips to Princeton – and counted it a most stimulating experience.

C. Discs (2%)
   1. Concentration
   2. Application
   3. Storage

D. Interpretation (2%)

V. Media (10%)
   A. Types (7%)
      1. Basic
      2. Differential (selective)
      3. Enrichment
   B. Preparation (3%)
      1. Age
      2. pH
      3. Sterilization
      4. Storage

VI. Equipment
   A. Microscope (Light, dark-field, fluorescent) (3%)
   B. Centrifuge
   C. Sterilizing equipment
   D. Anaerobic equipment (2%)
   E. Incubation equipment
   F. Rotators

VII. Quality Control (5%)
   A. Staining (1.5%)
   B. Reagents (1.5%)
   C. Media (2%)

ABILITIES

(As defined by Bloom's *Taxonomy of Educational Objectives*)

Knowledge: 40%
Application: 50%
Comprehension: 5%
Analysis: 5%

ITEM TYPES

Five-choice completion: 60%
Five-choice classification sets: 20%
Diagram sets: 10%
Laboratory sets: 10%

HEMATOLOGY

CONTENT

1. White Count (7%)
2. Red Count (3.5%)
3. Hemoglobin (7%)
4. Hematocrit (7%)
5. Normal differential count (10.5%)
6. Reticulocyte count (3.5%)
7. Sedimentation rate (5.5%)
8. Platelet count (5.5%)
9. Prothrombin time (7%)
10. Partial thromboplastin time (7%)
11. Coagulation time (5.5%)
12. Bleeding time (3.5%)
13. Clot retraction (2%)
14. Fibrinogen and lysis (2%)
15. Sickle preparation (3.5%)
16. Electrophoresis (Hemoglobin) (3.5%)
17. LE Preparation (2%)
18. Osmotic fragility (2%)
19. Immunoglobulins (2%)
20. General techniques (7%)
21. Urine sediment examination (3.5%)

A second aspect of the content for this examination is represented by the following categories:

(A) Manual
(B) Mechanized
(C) Quality
(D) Limits of the method
(E) Departure from the normal

ABILITIES

(As defined by Bloom's *Taxonomy of Educational Objectives*)

Questions will primarily test knowledge and application, with a small number testing comprehension.

When the newly written questions were received at ETS, they were put into uniform editorial style and then mailed to the appropriate Examining Committee members for review. Each examiner reviewed each of the questions in his field, selected an answer to it, and rated it as to the appropriateness of the content and the adequacy of the wording. Answers, ratings and comments from all Committee members were assembled in form for easy review by the Committees.

The Committees met again late in the year to come up with completed questions. Guided by the assembled comments and by their face-to-face discussions, they determined which of the submitted questions were suitable for further consideration. Some were discarded because they were not at the proper level, some were revised to make sure they had only one correct answer, and some were accepted as submitted.

The questions received a further review by the ETS Science Department staff to locate places where technically acceptable simplifications of wording were possible and by the ETS editorial staff for grammatical flaws and uniformity of style. Then some 250 questions in each field were readied for pretesting – to determine the difficulty of the questions and to locate ambiguities in wording. Copies of the assembled pretests were sent to Examining Committee members for review.

ITEM TYPES

Principally, five-choice completion questions
Secondarily, classification sets and diagram sets

COLOR

Alone among the Examining Committees, the Hematology Committee recommended the use of color as highly important. A sheet of color plates was prepared and included in the examination booklet.

BLOOD BANKING

CONTENT

I. Immunology and Genetics (10%)
   - A. Genetics (2%)
   - B. Antigen – antibody reactions (8%)
     1. Complement
     2. Agglutination
     3. Hemolysis
     4. Antiglobulin test
     5. Optimal conditions of reaction

II. Blood Group Systems (25%)
   - A. A, B, O (12%)
     1. Forward typing
     2. Reverse typing
     3. Subtyping
     4. Problems
   - B. Rh (8%)
     1. Rh_o (D)
     2. Phenotyping
     3. Problems; such as autologous control
   - C. Other (5%)
     1. Other blood group systems
     2. Private antigens
     3. Public antigens

III. Compatibility (25%)
   - A. Routine procedures (7%)
   - B. Massive transfusions (2%)
   - C. Multiple transfusions (2%)
   - D. Exchange transfusions for hemolytic disease (2%)
   - E. Rh immune globulin (2%)
   - F. Transfusion of blood components (2%)
   - G. Patient identification (4%)
   - H. Selection of blood for compatibility Universal donor (4%)

IV. Special Techniques (10%)
   - A. Antibody detection
   - B. Antibody identification
   - C. Elution techniques
   - D. Transfusion reaction work-up
   - E. Hemolytic disease work-up
   - F. Auto-immune disease

V. Standards, General Procedures (30%)
   - A. Donor requirements
   - B. Collection of blood
   - C. Identification of donor blood (14%)
   - D. Care of donor
   - E. Storage and transportation (4%)
   - F. Preparation of components (4%)
   - G. Transfusion service records (4%)
   - H. Blood group reagents and equipment (4%)

ABILITIES

(As defined by Bloom's *Taxonomy of Educational Objectives*)
Knowledge: 40%
Comprehension: 10%
Application: 40%
Analysis: 10%

ITEM TYPES

Discrete five-choice completion: 70%
Classification sets: 10%
Multiple completion: 10%
Situational sets: 10%

EXHIBIT B:
Item Writers

CLINICAL CHEMISTRY

Dean Arvan, M.D., Philadelphia, PA
Myrton F. Beeler, M.D., New Orleans, LA
Re: B. Conn, M.D., Baltimore, MD
James R. Heltsley, MS, MT(ASCP), Auburn, AL
Roy B. Johnson, Jr., La Jolla, CA
Kai Kristensen, M.D., La Jolla, CA
Col. Howard C. Leifheit, Fort Sam Houston, TX
Glenn W. Madere, Jr. San Antonio, TX
Robert Modica, Grand Rapids, MI
Solomon Notrica, Long,Beach, CA
MSG Henry M. Radcliffe, Jr., MT(ASCP), Fort Sam Houston, TX
Major Charles Ritchey, Fort Sam Houston, TX
Jenny Seaton, MT(ASCP), Lexington, KY
David Seligson, M.D., New Haven, CT
Emilio P. Unanue, M.D., San Diego, CA

MICROBIOLOGY

W. E. Bernard, HMC, Bethesda, MD
Donna J. Blazevic, Minneapolis, MN
Eileen Broberg, Wichita, KS
Dennis L. Carr, M.A., Wichita, KS
Frances Casey, Brooklyn, NY

Harry P. Dalton, Ph.D., Richmond, VA
Charles E. H. Fenton, Burlington, VT
Major Robert Marraro, Columbus, OH
William J. Martin, Ph.D., Rochester, MN
Richard Rosner, Paterson, NJ
Lt. Deane Shubert, MSC, USN, Portsmouth, VA
Capt. William W. Sultan, Jr., USAF, Wright-Patterson AFB, OH
M. C. Wethington, West Caldwell, NJ
S/M Sgt. Fred R. Williams, Wright-Patterson AFB, OH

HEMATOLOGY

Barbara Aushter, Silver Spring, MD
James J. Biemer, M.D., Tampa, FL
Lawrence Clark, Landover, MD
Jane Dorsey, Charleston, SC
Robert J. Hartsock, M.D., Pittsburgh, PA
Joyce Ioannidis, Charleston, SC
Robert E. Jones, M.D., Anderson, SC
James H. Kelly, M.D., Albany, NY
Mary Margaret Kelley, Kansas City, MO
Capt. Clyde Marsteller, Silver Spring, MD
Mrs. Robert Newsome, Silver Spring, MD
Anne Stiene, Lexington, KY
TSG Raymond L. Summers, Montgomery, AL
Ann Thompson, Charleston, SC

BLOOD BANKING

LTC Truman E. Allen, Jr., Fort Knox, KY
Kathryn Beattie, BB, MT(ASCP), Detroit, MI
Irene Block, MT(ASCP), Detroit, MI
Major Jerry R. Brewer, Oxon Hill, MD
Jane C. Corner, MT(ASCP), Rochester, NY
Mary Jessie Craycroft, MT(ASCP), Fort Knox, KY
Narcissa Hocker, BB, MT(ASCP), Indianapolis, IN
Lt. Donald R. Levan, MSC, USN, Washington, DC
Margaret E. McPeak, MT(ASCP), Fort Knox, KY
Corinne Monroe, BB, MT(ASCP), Long Beach, CA
L. M. Pleasant, DAC, El Paso, TX
Lt. Col. William B. Price, Andrews AFB, MD
Major James E. Spiker, Jr., Fort Sam Houston, TX
Joseph M. Tuggle, Rockville, MD

Pretesting and Norming

Both pretesting and norming were required, once the test items had been prepared.

Pretesting is trying out each suggested test item to learn about its ambiguities, its difficulty, and whether it discriminates well between those who generally know the subject of the test and those who don't. Pretested items can be discarded, revised, or used "as-is" in the final version of the test, depending on what has been learned about them.

Norming is administering the final examination to a sample population to provide scales with which an individual candidate's score can be compared.

NCCML assembled a Subcommittee on Pretesting and Norming for a one-day meeting in November 1970 to consider with ETS staff the requirements for pretesting and norming and to recommend a means of obtaining the cooperation of sufficient numbers of laboratory workers to take the tests on such a trial basis. Subcommittee members were:

Joe M. Blumberg, M.D., Major General, USA (Ret.), Co-Chairman of the Proficiency Examinations project
E. Martin Egelston, American Hospital Association
John Foft, M.D., Chairman, Department of Clinical Pathology, University of Alabama Hospitals
Col. Harvey P. Graham, M.D., Office of the Surgeon General, Department of the Army
Linda J. McKay, Management Analyst, Education Service, Veterans Administration (representing Ms. Phillips and Dr. Musser)

The Advisory Committee had stated that the norming population must be – and the pretesting population should be – made up of those who have recently reached the level it is hoped those taking the completed examinations can reach. While the contract for the project required that the examinations be normed on those who have passed the ASCP Certified Laboratory Assistant – CLA(ASCP) – examination, the Advisory Committee regarded this specification as a minimum.

The Subcommittee took this and other Advisory Committee recommendations, considering them in the light of practical problems involved, and agreed on the following guidelines for those who would be asked to participate in the pretesting and norming:

- 900 participants should be sought for pretesting and 1,200 for norming.
- Participants should understand the project and its hoped-for impact on laboratory careers and should be motivated to do a good job. There were no funds to pay honoraria.
- Participants should have been working successfully in a clinical laboratory for at least a year. There would be no review of individual qualifications, rather a reliance on the judgment of the supervisor asked to volunteer the employee's time.
- A random mix of specialists and generalists could be expected to yield hoped-for pretesting and norming results. All participating generalists and specialists would be examined in all four subject matter areas.
- Participants should reflect a geographical spread and various types of facilities, e.g. (1) military hospital laboratories, (2) civilian hospital laboratories, including VA hospitals, PHS hospitals, other public and private hospitals, and (3) independent laboratories.
- For norming purposes, additional qualifications would be sought. There should be a group at the baccalaureate level – MT(ASCP) certified or with a baccalaureate degree. A second group would be at the technician/assistant level, including CLA(ASCP) or MLT(ASCP) certified, or workers meeting Medicare technician standards (including those who have been technician trainees in acceptable laboratories for two years, or those who have completed the one-year laboratory course in one of the Armed Services).

EXHIBIT C:

Pretesting/Norming Participants

NON-FEDERAL HOSPITALS

DeKalb General Hospital, Decatur, GA (Frankie Murphy)
DePaul Hospital, Norfolk, VA (Robert J. Falconer, M.D.)
Georgia Baptist Hospital, Atlanta, GA (Robert E. DeLashmutt, M.D. and Charles E. Allen, MT(ASCP))
Medical Center Laboratory, Yakima, WA (Sandra Proebstel)
Memorial Hospital Medical Center, Long Beach, CA (E. R. Jennings, M.D.)
Mercy Hospital, Baltimore, MD (R. T. Lancaster, M.D.)
Saint Agnes Hospital, Fond du Lac, WI (R. E. Carlovsky, M.D. and Hattie Skilbred, MT(ASCP))
Saint Joseph's Hospital, Tacoma, WA (D. E. Wilhyde, M.D.)
Saint Vincent Infirmary, Little Rock, AR (Allen R. Rozzell, M.D.)
West Jersey Hospital, Camden, NJ (Ms. Warwick)

VETERANS ADMINISTRATION HOSPITALS

V. A. Hospital, Los Angeles, CA (Ben Fishkin, M.D.)
V. A. Hospital, Hines, IL (John Clinger, M.D.)
V. A. Hospital, Minneapolis, MN (Miguel Azar, M.D.)
V. A. Hospital, East Orange, NJ (P. Tabenkin)
V. A. Hospital, New York City, NY (Norman S. Cooper, M.D.)
V. A. Hospital, Wood, WI (Karl Pintar, M.D.)

PUBLIC HEALTH SERVICE HOSPITALS

U.S. Public Health Service Hospital, New Orleans, LA (William B. Cherry, M.D.)
U.S. Public Health Service Hospital, Staten Island, NY (James Hensley)

HOSPITAL ASSOCIATIONS

Connecticut Hospital Association, New Haven, CT (Robert D. Bergeron)
Health Careers Council of Illinois, Chicago, IL (Donald C. Frey)
Kansas State Hospital Association, Topeka, KS (Larry Shaffer)
Twin City Hospital Association, Minneapolis, MN (Mildred K. Brown)
Hospital Research & Educational Trust of New Jersey, Princeton, NJ (Thomas F. Gallagher)
South Carolina State Hospital Association, West Columbia, SC (Herbert Weisberg)

INDEPENDENT LABORATORIES

Associates in Laboratory Medicine, Tuscon, AZ (Clyde Kersten)

Many of these guidelines were followed closely as the project continued. Others proved to be impractical or unadvisable as circumstances developed.

Pretesting

Subcommittee members and others sought assistance from laboratories willing to participate in the pretesting. Laboratory directors and supervisors were asked to select workers who met the criteria listed above. Many agreed to help.

Military laboratory cooperation was easily obtained as a result of the approval and assistance of the Armed Forces Institute of Pathology and the Army Surgeon General's Office. The Veterans Administration headquarters pathology service secured the cooperation of laboratories in several VA hospitals. Public Health Service hospitals were also involved.

Cooperation from other hospitals came through the efforts of state and metropolitan hospital associations suggested by the American Hospital Association. Local pathology and medical technology societies and hospital administrators helped to assemble workers from small and large, urban and rural hospitals. Directors of independent laboratories volunteered to cooperate as a result of an NCCML mailing to Medicare-approved laboratories to solicit participation in the pretesting and norming process.

Exhibit C lists the hospitals, laboratories and organizations which participated in the pretesting process in March 1971 and the initial norming a few months later.

Test experts at ETS were delighted with the pretest results, pronouncing them the best they had ever had in a biological science field.

Answer sheets from the pretesting were the basis for determining the difficulty of each question, the number of pretest candidates selecting each of the options for each question, and mean test scores of test-takers who chose each option. The relationship of performance on each question with performance on the test containing the question was also obtained.

On the basis of the test descriptions prepared by the committees of examiners and of the results of the pretesting, ETS assembled two forms of each of the four tests. Each form was unique: no question appeared on

Bloomington Cornbelt Biochemical Laboratory, Inc., Bloomington, IL (Joyce Yeast)
Colonial Laboratory, Orlando, FL (Richard Carr)
Ferris Medical Laboratory, Lawton, OK (Gary Lavallee)
Kaufman Laboratory, Memphis, TN (Frances C. Kaufman)
Lattimore-Fink Laboratory, Topeka, KA (Mrs. Paula M. Quinley, MT/ASCP)
Medical Services Laboratory, Dubuque, IO (Robert Dimel)
Pathology Laboratory, Los Gatos, CA (Corrine McAlpin)
Penn Medical Laboratory, Pittsburgh, PA (Joseph Scandinaro)

AIR FORCE HOSPITALS

Andrews Air Force Base, D.C. (M/Sgt. Anthony W. Webster)
Carswell Air Force Base, TX (Maj. Robert G. Houston)
Chanutte Air Force Base, IL (Maj. Euril W. Perry)
Davis-Monthan Air Force Base, AZ (Maj. John F. Schultz)
Elgin Air Force Base, FL (M/Sgt. Harrington)
Fairchild Air Force Base, WA (Maj. Frank J. Holub)
Keesler Air Force Base, MS (Maj. Richard Deronndau)
Lackland Air Force Base, TX (Cora Apollon)
Langley Air Force Base, VA (Capt. Richard A. Kammeier)
MacDill Air Force Base, FL (Capt. Richard F. Sellers)
March Air Force Base, CA (Maj. Arthur L. Johnson)
Maxwell Air Force Base, AL (Capt. Conrad L. Bush)
Offutt Air Force Base, NE (Maj. Ralph Miterai)
Scott Air Force Base, IL (Lt. Thomas B. McGaughy)
Shaw Air Force Base, SC (Capt. Paul F. Franssen)
Sheppard Air Force Base, TX (Maj. Gerald N. Black)
Travis Air Force Base, CA (T/Sgt. Calvin W. Gitsham)
Westover Air Force Base, MA (Senior M/Sgt. Gene Estes)

ARMY HOSPITALS

1st U.S. Army Medical Laboratory, Ft. McPherson, GA (Lt. Col. Lowell Larsen)
4th U.S. Army Medical Laboratory, Ft. Sam Houston, TX (Col. Dale Snyder)
6th U.S. Army Medical Laboratory, Ft. Baker, CA (Col. Glenn West)
Brooke Army Medical Center, Ft. Sam Houston, TX (Col. Stuart Chamblin and Henry M. Radcliffe, Jr.)
Ireland Army Hospital, Ft. Knox, KY (Maj. James McManis)
Letterman General Hospital, San Francisco, CA (Col. Clarke Harding)
Martin Army Hospital, Ft. Benning, GA (Maj. Julian Coggin)
Tripler General Hospital, Honolulu, HA (Col. John Hardman)
Walter Reed Army Medical Center, Washington, DC (Paul H. Larsen, M.D. and Col. David Robinson)
William Beaumont General Hospital, El Paso, TX (Col. Donald McNair and Capt. James H. Anschutz)
U.S. Army Hospital, Ft. Ord, CA (Maj. John Brazinsky)

MISCELLANEOUS

American Society of Clinical Pathologists, Chicago, IL (Robert M. Gertz)
College of Health Related Professions, University of Florida, Gainesville, FL (David S. Lindberg, Ed.D.)
McBride Clinic, Inc., Oklahoma City, OK (J. N. Owens, M.D.)
Miami-Dade Junior College, Miami, FL (Elizabeth Lundgren, MT(ASCP))
William Kelly, Lake Worth, FL

both Form A and Form B. The tests were reviewed by mail by Examining Committee members, and their comments were incorporated into the two final printed test booklets.

Norming – Plan One

Norming involves reporting the test scores of a known group of laboratory workers. Such normative scores provide a standard against which to measure the scores of any individual candidate.

Norming proved to be by far the most difficult part of developing the Proficiency Examinations for Clinical Laboratory Personnel.

The initial plan was to give a special norming administration of the tests in July 1971 to groups of laboratory workers designated by their employers, according to the specifications of the Subcommittee on Pretesting and Norming.

Motivation remained an uncertainty, but it was hoped that an explanation of the project's purposes would persuade norming volunteers of the importance of doing their best on the tests.

Participation was sought through the same means as had been used for the pretesting in the Spring. Assistance was promised by military and civilian hospitals and by independent laboratories.

But a majority of the candidates who had been "volunteered" by their supervisors did not appear for the tests.

ETS made efforts to locate additional candidates in populous areas of the Middle Atlantic States, but no more than a few could be found in any one location.

Thus, after demonstrating a remarkably successful method of preparing Proficiency Examinations, the project had demonstrated the difficulty of providing norms through special administration of tests to workers who could not expect to gain from taking them.

Norming – Plan Two

Another valid way of providing normative data is to compile scores of a selected group of candidates taking the examinations, and it was to this method ETS and NCCML turned to norm Form A of the tests in the Fall of 1971.

The pilot administrations of the Proficiency Examinations in November 1971 and May 1972 are described in detail in a subsequent section of this report. From information included on the registration form, ETS selected November 1971 candidates on the technician level who had one or two years of laboratory training and one to five years of laboratory experience. Two groups were designated:

- Group I included 233 technicians who had received military training.
- Group II included 129 candidates trained in civilian hospitals.

Separate scores for each group and scores for the two groups combined on Form A of the four tests were reported in a *Content and Norming* booklet distributed in January 1972 to the candidates and to directors of 5,500 hospital laboratories and 2,800 independent laboratories across the country. Tables for the two groups showed percentile rankings and mean (average) scores.

These norms were considered "preliminary," since the groups involved were relatively small and the registration form had not been designed specifically to extract relevant background data about each candidate so as to compile a demographic description of the norming groups. The tables were reprinted in the second Interim Report of the project in August 1972. Since they have now been superseded by more complete norming information for Form A, they are not included in this report. It is of interest to note, however, that they showed the military group scoring from four to fourteen points higher than the civilians.

Norming – Plan Three

For Form B of the Proficiency Examinations, given first in May 1972, two changes in procedure were made: (1) more information was obtained on the candidates and their backgrounds, and (2) the decision on which candidates to include in the norming sample was made by the National Advisory Committee at its meeting in June 1972 after reviewing the scores of a wide variety of candidate groups.

A questionnaire was distributed to all candidates at the test centers, seeking information on age, sex, geographic location, laboratory training, general education, certification, laboratory experience, job title, and present employer. Nearly all the candidates completed the questionnaire as requested.

Educational Testing Service was then able to provide detailed score information for candidates with a variety of backgrounds – for example, those who had had 7-12 months of laboratory training, or 13-18 months, or 24 months or more; those who had had less than 1 year of laboratory experience, on up to those with more than 20 years; those who had attended CLA schools or junior colleges or proprietary schools or military laboratory training programs; those whose general education stopped at high school, or those who went on to varying amounts of college. Mean scores and standard deviations for all these various breakdowns were presented to the Advisory Committee at its meeting.

With the data in front of them, Advisory Committee members could see which factors appeared to influence the scores significantly. They drew the lines to provide as large a norming group as possible, and agreed on the following as the appropriate composition of the norming groups:

- Only laboratory technicians with formal laboratory training below the level of the Medical Technologist would be included.
- Those with seven or more months of training would be included, no matter what their experience.
- Those with fewer than seven months of training would be included if they had five or more years of laboratory experience.
- Scores would be shown separately for civilian-trained and military-trained groups, and for the two groups combined.
- Background information on the groups would also be reported.

The Committee decided not to report information on the scores of medical technologists who took the Examinations, although the original recommendation of the subcommittee before the tests were completed had been to do so. Although there was some doubt when the Examining Committees began their work as to the differentiation between the bench worker technician level and the medical technologist, the finished tests proved the Examining Committees had been able to make that distinction. Knowledge and skills on the working technician level were the subject of the four tests. The more complicated supervisory and trouble-shooting aspects of the technologist's work were not included. After looking at the tests at its June 1972 meeting, the Advisory Committee decided it would be inappropriate to publish normative scores achieved by medical technologists, since the tests had been designed for a lower level.

A new *Norming Data* booklet for Form B was published in August 1972, following the Committee's

directions. It included the score information and background information in Exhibits D and E.

Again the candidates with military training and experience consistently bettered the scores of the civilian-trained.

Norming – Plan Four

Next step in the norming process was to obtain norms for Form A as sound as those which had been developed for Form B.

It was agreed that candidates taking Form A in December 1972 who met the Advisory Committee requirements would be selected, and their scores would be analyzed in the same way as for the May 1972 candidates.

Again a problem developed. As described in the next chapter, the number of candidates was smaller than expected, and the number meeting the norming criteria thus fell far below that necessary for statistical purposes.

Attention therefore turned back to the large group of candidates who had taken Form A the year before. Scores published for that group had been considered "preliminary" because the norming groups then defined were small and the background information on the candidates was deemed incomplete or unclear. Both problems, it developed, could be overcome.

EXHIBIT D:

Percentile Distributions–Form B

The following table shows the percentile rankings for the norming groups on each of the four tests. 75 was a perfect score. The percentiles show the percentage of the group getting scores *below* each possible pair of scores. Thus a civilian-trained technician who scored 28 in Clinical Chemistry did better than 64% of Group I, and a military-trained technician who scored 45 in Blood Banking did better than 79% of Group II.

	GROUP I -- 436 Civilian-Trained Technicians				GROUP II -- 364 Military-Trained Technicians					GROUPS I & II 800 Laboratory Technicians				
Scores	Clin. Chem.	Micro-biology	Hema-tology	Blood Banking	Scores	Clin. Chem.	Micro-biology	Hema-tology	Blood Banking	Scores	Clin. Chem.	Micro-biology	Hema-tology	Blood Banking
74-75					74-75		99.8			74-75		99.9		
72-73					72-73		99.7			72-73		99.8		
70-71					70-71		99			70-71		99.7		
68-69		99	99.3	99.8	68-69		99	99.8		68-69		99	99.9	99.9
66-67		98	99.7	99.5	66-67	99.8	99	99.5		66-67	99.9	98	99.6	99.7
64-65		98	99.6	99	64-65	99.7	98	99	99.8	64-65	99.8	98	99	99
62-63		97	99	99	62-63	99.7	96	98	99	62-63	99.8	97	98	99
60-61	99.9	96	98	99	60-61	99	95	97	99	60-61	99.7	95	97	99
58-59	99.7	94	96	98	58-59	99	93	94	98	58-59	99	94	95	98
56-57	99.7	94	94	98	56-57	98	92	91	97	56-57	99	93	93	97
54-55	99	93	91	97	54-55	98	88	87	96	54-55	99	91	90	97
52-53	99	92	87	96	52-53	96	84	81	94	52-53	98	88	84	95
50-51	99	90	79	94	50-51	94	80	75	91	50-51	97	85	78	93
48-49	99	88	75	92	48-49	92	76	68	87	48-49	95	82	72	90
46-47	98	86	68	90	46-47	89	72	60	84	46-47	94	79	64	87
44-45	97	84	60	88	44-45	85	66	53	79	44-45	92	74	57	84
42-43	96	81	52	86	42-43	81	57	44	74	42-43	89	69	48	80
40-41	94	77	45	82	40-41	77	52	35	68	40-41	86	64	40	75
38-39	91	72	37	76	38-39	71	46	29	62	38-39	82	59	33	69
36-37	87	67	28	72	36-37	67	41	23	56	36-37	77	54	26	65
34-35	83	62	22	67	34-35	62	36	17	51	34-35	73	49	20	60
32-33	78	57	17	61	32-33	56	31	13	45	32-33	68	44	15	54
30-31	72	52	13	54	30-31	49	26	10	39	30-31	61	39	12	47
28-29	64	48	10	47	28-29	40	22	7	32	28-29	53	35	9	40
26-27	57	43	8	40	26-27	32	18	5	27	26-27	46	30	7	34
24-25	50	37	6	34	24-25	26	14	4	21	24-25	39	25	5	28
22-23	42	31	5	27	22-23	21	11	3	17	22-23	32	21	4	22
20-21	33	27	3	21	20-21	16	9	2	12	20-21	25	18	3	17
18-19	24	23	3	17	18-19	12	7	2	9	18-19	18	15	2	13
16-17	17	18	2	13	16-17	10	6	1	7	16-17	14	12	2	11
14-15	12	13	1	11	14-15	7	4	0.6	6	14-15	10	8	1	8
12-13	8	9	0.6	8	12-13	4	3	0.3	4	12-13	6	6	0.6	6
10-11	6	6	0.5	4	10-11	3	2	0.3	3	10-11	4	4	0.4	3
8-9	4	4	0.4	2	8-9	1	1	0.3	1	8-9	3	2	0.4	2
6-7	2	2	0.3	1	6-7	1	0.5	0.3	0.7	6-7	2	1	0.3	0.9
4-5	1	2	0.3	1	4-5	0.8	0.5	0.3	0.4	4-5	1	1	0.3	0.7
2-3	0.7	2	0.1	0.6	2-3	0.5	0.3	0.3	0.2	2-3	0.6	1	0.2	0.5
0-1	0.1	0.5		0.3	0-1	0.2	0.2	0.2		0-1	0.2	0.3	0.1	0.2
Avg.	25.26	30.65	41.46	30.02	Avg.	31.71	39.08	43.50	34.32	Avg.	28.25	34.89	42.39	32.05
No. in Group	344	285	376	313	No. in Group	297	288	317	280	No. in Group	641	573	695	593

EXHIBIT E:

Background Information on Norming Groups

	GROUP I -- 436 Civilian-Trained Technicians	GROUP II -- 364 Military-Trained Technicians	GROUPS I & II 800 Laboratory Technicians
Sex	13% male / 87% female	94% male / 6% female	53% male / 47% female
Age	58% under 25 / 28% 26-35 10% 36-45 / 4% over 45	32% under 25 / 44% 26-35 18% 36-45 / 6% over 45	45% under 25 / 36% 26-35 14% 36-45 / 5% over 45
Geographic Location	47% Northeast / 20% South 30% North Central / 3% West	13% Northeast / 38% South 14% North Central / 25% West 10% Overseas	30% Northeast / 29% South 22% North Central / 14% West 5% Overseas
Formal Laboratory Training	1% under 7 months 58% 7-12 months 25% 13-18 months 16% more than 18 months	6% under 7 months 34% 7-12 months 45% 13-18 months 15% more than 18 months	3% under 7 months 46% 7-12 months 35% 13-18 months 16% more than 18 months
Type of Laboratory School	57% CLA school 13% junior college 30% other civilian program	28% Army 38% Navy 34% Air Force	29% CLA school 7% junior college 15% other civilian program 14% Army 18% Navy 17% Air Force
General Education	56% high school 37% 1-2 years college 7% 3 or more years college	32% high school 42% 1-2 years college 26% 3 or more years college	44% high school 39% 1-2 years college 17% 3 or more years college
Degrees	85½% none / 12% associate 2% baccalaureate / ½% higher	77% none / 6% associate 15% baccalaureate / 2% higher	81% none / 9% associate 9% baccalaureate / 1% higher
Job Title	10% trainee 23% laboratory assistant 60% laboratory technician 4% supervisor/instructor 3% other	4% trainee 3% laboratory assistant 60% laboratory technician 7% medical technologist 21% supervisor/instructor 5% other	7% trainee 13% laboratory assistant 60% laboratory technician 3% medical technologist 13% supervisor/instructor 4% other
Place of Employment	82% civilian hospital 7% independent laboratory 2% military installation 9% other	24% civilian hospital 5% independent laboratory 68% military installation 3% other	54% civilian hospital 6% independent laboratory 34% military installation 6% other
Experience	19% less than 1 year 30% 1 to under 3 years 21% 3 to under 5 years 13% 5 to under 7 years 6% 7 to under 9 years 4% 9 to under 11 years 4% 11 to under 15 years 2% 15 to under 20 years 1% 20 years or more	13% less than 1 year 26% 1 to under 3 years 11% 3 to under 5 years 13% 5 to under 7 years 7% 7 to under 9 years 8% 9 to under 11 years 10% 11 to under 15 years 7% 15 to under 20 years 5% 20 years or more	16% less than 1 year 28% 1 to under 3 years 16% 3 to under 5 years 13% 5 to under 7 years 6% 7 to under 9 years 6% 9 to under 11 years 7% 11 to under 15 years 5% 15 to under 20 years 3% 20 years or more

College background may or may not have been in natural sciences. Job titles were supplied by candidates. No MT (ASCP)s are included.

Since the Advisory Committee had adopted its new broader criteria for the norming group, the number of candidates could be increased. And the project coordinator made a personal review of each registration form, clearing up what had been uncertainties for ETS keypunch operators. Some biographical information was unavailable, but most proved to be solid.

When the group meeting the new criteria was drawn from the candidates who had taken Form A, it was found the group's average experience was longer than was that of the Form B group, and it had a larger percentage of the higher-scoring military-trained technicians. In order to minimize these sample differences, the scores for Form A were appropriately weighted with respect to experience and training to produce comparable percentile distributions.

Exhibit F is the new comprehensive table of percentile rankings which has now been widely distributed, giving scores on Forms A and B of each of the four tests.

Accompanying the table were these new instructions on how to read the proficiency examinations scores:

> Perfect score was 75. The percentiles show the percentage of the group getting scores *below* each possible pair of scores. To compare an individual candidate's score with these norms, determine which Form the candidate took, and compare only with the columns for that Form. (Form A was given in November 1971 and December 1972, Form B in May 1972 and May 1973.)
>
> First find the candidate's score in the left-hand column, then read across to the appropriate test column to find the percentage of the norming group who got scores *below* that score. For example, if a candidate has a score of 26 on Form A of the Clinical Chemistry test, the table shows that his performance was better than the performance of 35% of the norming group on that test, and that 65% of the norming group did as well as or better than he did. Similarly if a candidate has a score of 51 on Form B of the Hematology test, his performance was better than the performance of 78% of the norming group on that test, and 22% did as well as or better than he did.
>
> Average scores and the number of candidates in each group are shown at the bottom of the columns.

Circles were drawn as shown in Exhibit F in an effort to make this information as clear as possible.

EXHIBIT F:

Percentile Distributions—Forms A & B

Scores	Clinical Chemistry		Microbiology		Hematology		Blood Banking	
	Form A*	Form B	Form A*	Form B	Form A*	Form B	Form A*	Form B
74-75			99.9	99.9				
72-73			99.2	99.8	99.9			
70-71			98	99.7	99.8			
68-69	99.7		98	99	99.4	99.9	99.8	99.9
66-67	99.5	99.9	97	98	99	99.6	98	99.7
64-65	99	99.8	96	98	99	99	98	99
62-63	98	99.8	92	97	96	98	98	99
60-61	98	99.7	90	95	95	97	97	99
58-59	97	99	87	94	91	95	96	98
56-57	95	99	86	93	88	93	95	97
54-55	93	99	81	91	84	90	92	97
52-53	91	98	77	88	77	84	90	95
50-51	89	97	74	85	72	78	88	93
48-49	89	95	68	82	65	72	84	90
46-47	87	94	64	79	59	64	83	87
44-45	85	92	59	74	52	57	78	84
42-43	80	89	51	69	44	48	74	80
40-41	78	86	48	64	38	40	69	75
38-39	75	82	43	59	32	33	62	69
36-37	68	77	38	54	26	26	58	65
34-35	60	73	33	49	20	20	53	60
32-33	53	68	29	44	16	15	48	54
30-31	49	61	25	39	13	12	44	47
28-29	43	53	23	35	10	9	39	40
26-27	35	46	20	30	8	7	35	34
24-25	29	39	18	25	6	5	29	28
22-23	23	32	14	21	4	4	24	22
20-21	18	25	12	18	2	3	20	17
18-19	13	18	9	15	1	2	17	13
16-17	9	14	8	12	1	2	13	11
14-15	6	10	6	8	1	1	10	8
12-13	4	6	3	6	0.5	0.6	7	6
10-11	3	4	2	4	0.2	0.4	4	3
8- 9	1	3	2	2		0.4	2	2
6- 7	0.3	2	1	1		0.3	0.8	0.9
4- 5		1	1	1		0.3	0.2	0.7
2- 3		0.6	0.5	1		0.2		0.5
0- 1		0.2		0.3		0.1		
No. in Group	438	641	414	573	488	695	431	593
Average	32.15	28.25	40.41	34.89	43.51	42.39	33.39	32.05

*Weighted

Biographical information accompanying this newly-published comprehensive table [illegible] that shown in the third column of Exhibit E. It was noted that the weighting of scores for the Form A group with respect to experience and training had produced a similar distribution so the one biographical summary suffices for both norming groups.

Special Norms

Two special sets of norms have been prepared, in addition to the general norms described above. One provided the scores of a group drawn for purposes of Medicare officials in assessing the possible use of NCCML's Proficiency Examinations to qualify workers for Medicare's Technician standard. This effort is described in detail in the section on utilization.

To meet the need for normative data more specifically related to known levels in the laboratory, it was suggested last Spring that the Examinations be given to students completing Associate Degree Medical Laboratory Technician programs.

Directors of these AD-MLT programs were offered the opportunity to administer the Proficiency Examinations to their second-year students on May 5, 1973 (the date of the regular nationwide administration). Of 151 colleges invited to participate, 69 agreed to do so. Each college was provided a summary of all scores and a list of scores for its own students.

The cooperative arrangement allowed MLT students a "trial" test in anticipation of the MLT(ASCP) certifying examination in August. It gave AD-MLT programs a comparison of the performance of their own students against that of the large group from many other programs at the same level.

Here are the average scores of the graduating MLT students who took the tests. As expected, they are lower than scores of the over-all norming groups of working technicians:

Clinical Chemistry	22.2 (657 students)
Microbiology	26.8 (647 students)
Hematology	35.7 (671 students)
Blood Banking	24.3 (646 students)

These AD-MLT graduates formed a large portion of the candidates taking the MLT(ASCP) Registry examination in August. Since the Registry examination pass/fail score is set at one standard deviation below the mean of the group taking the test on any one day, it is safe to assume that a majority of these students are now ASCP-certified Medical Laboratory Technicians.

NCCML and ETS have been interested since the outset of this phase of the project in a possible comparison of these Proficiency Examinations scores with the August Registry examination performance of the same AD-MLT students. A memorandum offering to cooperate with the ASCP Board of Registry and the MLT Committee in a joint project to make this statistical comparison was sent by the NCCML Board of Directors to the joint Board meeting of the American Society of Clinical Pathologists and the College of American Pathologists held in mid-January 1974. In that memorandum, NCCML noted the expressed concern of members of the ASCP Board of Registry and the CLA and MLT Committees about the lack of Proficiency Examinations score information for identifiable levels of laboratory personnel, and pointed out that the proposed comparison could provide such information. NCCML and ETS offered to make the Proficiency Examinations scores available to the Registry for such a comparison, or to do the statistical work in Princeton at no cost to ASCP, whichever might be more acceptable. The proposal was not accepted.

Today's inflexible and frequently discriminatory requirements of a diploma or a degree in order to be considered for a job make little sense. They are quite rightly being attacked in the courts. What we need are some new systems for finding out whether an individual has the specific attributes to perform a particular task and the adoption of these systems by both employers and schools.

—HAROLD HOWE II, Vice President,
Ford Foundation (1972)

Test Administration

The Proficiency Examinations for Clinical Laboratory Personnel were administered during the pilot year by Educational Testing Service under an agreement with NCCML. Funding from the Manpower Administration under the contract allowed a trial period during which candidates could take the tests at no cost. Meanwhile, long-term arrangements were to be worked out whereby costs for administering the tests were to come from candidates' fees.

Originally, it had seemed possible that the tests could be administered by a variety of organizations. Later, practical considerations involving test security made clear there must be one agency in control. ETS was well equipped for the assignment.

The National Advisory Committee set up the guidelines for this aspect of the project, as it did for the others:

- There were no eligibility requirements.
- A candidate could take one or more of the four tests.
- A candidate could retake the tests if he wished.
- Scores were sent only to the candidate or to those persons he designated.

Under the agreement concerning administration of the tests, ETS agreed to (1) publish a *Bulletin of Information* for candidates about the examinations; (2) set up centers, secure and instruct test supervisors, and pay honoraria; (3) print and mail test booklets and answer sheets; (4) receive applications and produce and mail admission tickets; (5) machine score answer sheets, and produce and mail score reports; (6) provide test analysis and normative information; and (7) arrange all procedures to assure test security.

ETS set up "regular" test centers in 58 cities in 47 states; the list was included in the *Bulletin of Information.* In addition, it was agreed to set up a special center on request for any candidate in the United States who was more than 100 miles from a listed center. And the Department of Defense cooperated by agreeing to help ETS set up a special test center at any military installation overseas.

The tests were scheduled for Saturday mornings. When a request came for another test date from a candidate whose religious scruples prevented his taking the tests on a Saturday, ETS arranged a special administration on the following Monday. This option has been made available since the second administration and is now specifically mentioned in the *Bulletin of Information.*

Registration deadlines were set four weeks in advance of test dates, with another two weeks' lead time for requests for special test centers.

Candidates were instructed to report to their test centers at 8:30 a.m. Each candidate took only those tests he wished, in the order printed in the test booklet. An hour was allowed for each test. Those taking only one test could leave after one hour; those taking all four stayed through the entire session. Supervisors received comprehensive instructions on every aspect of administering the examinations, with special procedures to assure test security.

We were indeed pleased to note the gracious responsiveness of your Project organization in arranging for a special test date for those whose religious scruples prevent their taking the tests on Saturday. I'm sure there will be some worthy individuals who will owe their opportunity for career advancement to this kindly and thoughtful consideration.

—A.F. BROWN, M.D.,
Glendale Adventist Hospital (1972)

EXHIBIT G:

1971-72 Pilot Administrations

	Nov. 20, 1971	May 6, 1972	Total
Candidates registered	2,206	3,130	5,336
Candidates taking tests	1,470	2,107	3,577
Attrition	736	1,023	1,759
Rate	33.4%	32.7%	33.0%
Test Centers	118	163	281
Candidates taking:			
Hematology	1,163	1,652	2,815
Clinical Chemistry	1,030	1,486	2,516
Blood Banking	925	1,311	2,236
Microbiology	895	1,279	2,174
Candidates taking:			
No tests	2	2	4
One test	451	643	1,094
Two tests	170	247	417
Three tests	166	257	423
Four tests	681	958	1,639

There was no way to predict how many candidates would take the Proficiency Examinations during the pilot year, particularly since the tests were free. For funding purposes, NCCML had estimated that 2,000 candidates might be expected. ETS printed 2,300 test booklets just in case.

Both were underestimates.

The actual candidate total was 3,577. More than 2,200 registered to take the tests on November 20, 1971, and 1,470 candidates actually showed up. And of 3,130 who registered for the tests given on May 6, 1972, 2,107 appeared. (Attrition is to be expected for any test, and particularly for one which is offered at no charge.)

Information on the two pilot administrations is given in Exhibits G and H. Exhibit G shows how many were registered, how many took each of the four examinations, and how many took only one test, compared to those who took more than one. Exhibit H lists test centers and the numbers of candidates at each.

In November 1971, 118 test centers were established, including 21 military bases (15 of them overseas) and two prisons in addition to the regular and special civilian centers all over the U.S. In May 1972, 163 test centers were established, including 34 for military bases (23 of them overseas) and eight on ships at sea. Test centers were set up in May at three prisons, but the registrants did not appear.

The tests were given in 49 states. Many test centers were set up for only one candidate. The largest group was the 107 candidates taking the tests at Roosevelt University in Chicago in May.

No insoluble problems developed during the trial administration period.

ETS and NCCML ran out of their supply of 18,000 copies of the *Bulletin of Information* and application form long before the first deadline. Replacements including the most important information and the form were hurriedly prepared, and no one was prevented from taking the tests for lack of this material. An additional 40,000 copies of the *Bulletin* were printed for use in the Spring.

A more serious problem was the failure of three test supervisors to show up on November 20 at the appointed times and places, leaving candidates to return home disappointed. ETS arranged special makeup test dates for those candidates a few weeks later.

Post-Pilot Administrations

Most of the original arrangements for administering the Proficiency Examinations were written into the continuing agreement approved by the Advisory Committee and the Labor Department and entered into by NCCML and ETS. NCCML formulates policy under this agreement. ETS provides administration of the tests. ETS charges a candidates' fee, set by mutual agreement and designed to cover expenses. An arrangement for revising the tests is included, should funds become available. The agreement can be terminated by either party with a year's notice.

The 1972-73 fee was set at $25, with the hope that 2,000 or so candidates per year would make the actual test administration self-supporting. Fees would not pay the expenses of publicizing the Examinations and promoting use of their results by employers and agencies, however.

The fee presents a hardship for some candidates, particularly those in the Armed Forces and those in prisons. Although sources of support for both groups of candidates have been sought, no means of avoiding payment by such candidates has been found.

The number of candidates willing to pay $25 turned out to be a small fraction of those willing to take the free tests the year before. For the tests on December 2, 1972, there were 193 paid registrants, of whom 162 showed up. (This 16.1% attrition rate has never been explained.) There were 58 test centers, of which two were abroad and one on a Naval ship.

(Text continued on page 27.)

EXHIBIT H:

1971-72 Test Centers

Test Center	Nov. 71 (Applicants/Candidates)	May 72 (Applicants/Candidates)
ALABAMA		
Birmingham, Samford Univ.	9/ 8	12/ 8
Dothan, G. Wallace St. Tech. Jr. Coll.	–	2/ 0
Mobile, Mobile Coll.	10/ 5	12/12
Montgomery, Alabama State Univ.	–	17/12
ALASKA		
Adak, Naval Station	–	3/ 3
Anchorage, Anchorage Comm. Coll.	4/ 4	–
College, Univ. of Alaska	4/ 4	4/ 4
ARIZONA		
Phoenix, Phoenix Coll.	15/ 9	20/14
Tucson, Univ. of Arizona	1/ 0	–
ARKANSAS		
Little Rock, Univ. of Arkansas	22/ 4	10/ 3
CALIFORNIA		
Bakersfield, Bakersfield Comm. Coll.	–	1/ 1
Los Angeles, Occidental Coll.	42/18	46/21
Riverside, Univ. of California	15/11	9/ 3
San Diego, U.S. Naval Hospital	21/ 8	34/15
San Francisco, Univ. of San Francisco	37/20	54/33
Travis Air Force Base	–	7/ 7
COLORADO		
Alamosa,Adams State Coll.	–	4/ 4
Denver, Univ. of Denver	26/17	26/17
CONNECTICUT		
Hartford, Trinity Coll.	25/18	43/32
DISTRICT OF COLUMBIA		
Washington, Howard Univ.	53/28	71/42
FLORIDA		
Fort Myers, Edison Jr. Coll.	6/ 6	–
Jacksonville, Jacksonville Univ.	19/12	30/16
Melbourne, Florida Inst. of Tech.	7/ 7	3/ 3
Miami, Univ. of Miami	21/16	48/26
Orlando, Valencia Comm. Coll.	–	19/13
Pensacola, U.S. Naval Hospital	15/ 6	–
Tampa, Univ. of South Florida	23/19	10/ 5
GEORGIA		
Atlanta, Emory Univ.	32/20	44/32
Augusta, Augusta Coll.	9/ 9	–
Columbus, Columbus Coll.	1/ 1	10/ 8
Savannah, Armstrong State Coll.	–	3/ 0
HAWAII		
Honolulu, Univ. of Hawaii	24/24	18/15
IDAHO		
Boise, Boise State Coll.	3/ 3	1/ 1
Pocatello, Idaho State Univ.	–	8/ 5
ILLINOIS		
Bloomington, Illinois Wesleyan Univ.	–	3/ 2
Chicago, Roosevelt Univ.	55/42	144/107
Decatur, Millikin Univ.	6/ 6	–
INDIANA		
Fort Wayne, Indiana Inst. of Tech.	15/ 7	1/ 1
Indianapolis, Butler Univ.	31/21	39/33
Michigan City, St. Anthony Hospital	47/44	26/26
IOWA		
Cedar Falls, Univ. of Northern Iowa	4/ 4	–
Davenport, St. Ambrose Coll.	8/ 8	11/ 6
Des Moines, Drake Univ.	9/ 3	8/ 8
Keokuk, Southeastern Comm. Coll.	–	2/ 2
KANSAS		
Coffeyville, Coffeyville Mem. Hosp.	1/ 0	–
Dodge City, Dodge City Comm. Jr. Coll.	2/ 0	10/ 4
Phillipsburg, Great Plains Lutheran Hosp.		–
Pittsburg, Kansas State Coll.	–	1/ 0
Topeka, Washburn Univ.	30/22	29/24
Wichita, Wichita State Univ.	3/ 3	2/ 2
KENTUCKY		
Henderson, Henderson Comm. Coll.	–	13/ 6
Louisville, Univ. of Louisville	17/17	32/19
Somerset, Somerset Comm. Coll.	–	6/ 6
LOUISIANA		
Baton Rouge, Louisiana State Univ.	7/ 3	12/ 8
MAINE		
Augusta, Univ. of Maine	60/47	41/30
Presque Isle, Univ. of Maine	12/10	21/13
MARYLAND		
Baltimore, Johns Hopkins Univ.	17/17	–
Baltimore, Towson State Coll.	–	63/42
MASSACHUSETTS		
Boston, Northeastern Univ.	66/51	101/63
Springfield, American International Coll.	–	37/32
MICHIGAN		
Detroit, Univ. of Detroit	–	10/ 9
East Lansing, Michigan State Univ.	49/35	47/43
Gwinn, K. I. Sawyer Air Force Base	–	11/ 0
Houghton, Michigan Tech. Univ.	–	1/ 1
Sault Ste. Marie, Lake Superior St. Coll.	1/ 1	–
MINNESOTA		
Duluth, Univ. of Minnesota	2/ 2	–
Minneapolis, Univ. of Minnesota	20/ 9	42/31
MISSISSIPPI		
Columbus, Columbus Air Force Base	–	2/ 1
Jackson, Jackson State Coll.	–	11/ 7
Jackson, Millsaps Coll.	2/ 0	–
MISSOURI		
Columbia, Univ. of Missouri	7/ 3	–
Ft. Leonard Wood, Army Educ. Ctr.	–	16/16
St. Louis, St. Louis Univ.	49/34	77/61
Springfield, Drury Coll.	17/17	–
Warrensburg, Central Missouri St. Coll.	–	3/ 2
MONTANA		
Helena, Carroll Coll.	7/ 7	15/13
Miles City, Miles Comm. Coll.	–	5/ 5
Wolf Point, Wolf Point High School	–	1/ 1

Test Center	Nov. 71 (Applicants/Candidates)	May 72 (Applicants/Candidates)
NEBRASKA		
Norfolk, Northeastern Nebraska Coll.	–	2/ 2
North Platte, North Platte Jr. Coll.	3/ 1	8/ 7
Omaha, Creighton Univ.	14/14	25/19
NEVADA		
Las Vegas, Univ. of Nevada	3/ 3	8/ 5
Reno, Univ. of Nevada	–	3/ 2
NEW HAMPSHIRE		
Concord, Tech. Inst.	10/10	–
Laconia, N.H. Voc. Tech. Coll.	–	9/ 9
NEW JERSEY		
New Brunswick, Rutgers Univ.	70/43	83/58
NEW MEXICO		
Alburquerque, Univ. of New Mexico	12/ 7	14/14
Roswell, Eastern New Mexico Univ.	–	10/10
Santa Rosa High School	–	3/ 3
NEW YORK		
Albany, SUNY at Albany	–	21/16
Buffalo, SUNY at Buffalo	–	15/14
Griffiths Air Force Base	7/ 5	–
New York, City Coll. of N.Y.	70/45	112/69
Rochester, Rochester Inst. of Tech.	3/ 3	–
Syracuse, Syracuse Univ.	32/24	50/29
NORTH CAROLINA		
Asheville, Univ. of North Carolina	–	14/ 8
Durham, Duke Univ.	–	50/47
Greensboro, Univ. of North Carolina	24/10	43/23
Greenville, East Carolina Univ.	6/ 3	–
Camp LeJeune	–	21/16
NORTH DAKOTA		
Bismarck, Bismarck Jr. Coll.	7/ 7	7/ 4
Minot, Minot Air Force Base	–	32/28
OHIO		
Cincinnati, Univ. of Cincinnati	–	16/16
Cleveland, Cuyahoga Comm. Coll.	–	45/20
Cleveland, Cleveland State Univ.	30/21	–
Columbus, Ohio State Univ.	32/17	40/31
Dayton, Wright-Patterson A.F.B.	22/10	23/12
Toledo, Univ. of Toledo	1/ 1	–
OKLAHOMA		
Oklahoma City, Oklahoma City Univ.	12/ 6	17/ 6
OREGON		
Eugene, Univ. of Oregon	7/ 4	5/ 1
Klamath Falls, Oregon Tech. Inst.	1/ 1	–
Portland, Univ. of Oregon	–	3/ 0
PENNSYLVANIA		
Altoona, Veterans Adm. Hospital	5/ 5	–
Philadelphia, Temple Univ.	58/43	119/78
Pittsburgh, Duguesne Univ.	40/32	102/78
Williamsport, Lycoming Coll.	40/17	23/18
RHODE ISLAND		
Providence, Brown Univ.	19/14	35/21

Test Center	Nov. 71 (Applicants/Candidates)	May 72 (Applicants/Candidates)
SOUTH CAROLINA		
Anderson, T. L. Hanna High School	–	11/ 7
Charleston, Coll. of Charleston	20/20	15/10
Columbia, Univ. of South Carolina	–	8/ 7
Greenville, Furman Univ.	29/21	–
SOUTH DAKOTA		
Rapid City, South Dakota School of Mines & Technology	5/ 4	8/ 4
Sioux Falls, Augustana Coll.	–	2/ 2
TENNESSEE		
Knoxville, Univ. of Tennessee	18/18	10/ 6
Memphis, Memphis State Univ.	39/22	–
Nashville, Vanderbilt Univ.	7/ 7	16/14
TEXAS		
Abilene, McMurray Coll.	1/ 1	2/ 2
Big Spring, Howard County Jr. Coll.	1/ 1	–
Canyon, West Texas State Univ.	4/ 4	4/ 3
Dallas, Southern Methodist Univ.	68/53	59/35
Houston, Univ. of Houston	17/10	16/10
El Paso, Univ. of Texas	9/ 7	25/16
Ft. Hood, Army Educ. Ctr.	–	19/11
Marshall, Wiley Coll.	–	2/ 2
Midland, Midland Coll.	–	2/ 1
San Antonio, Fort Sam Houston	105/73	66/53
Temple, Temple Jr. Coll.	2/ 2	–
Wichita Falls, Midwestern Univ.	18/14	18/18
UTAH		
Salt Lake City, Univ. of Utah	7/ 7	28/24
VERMONT		
Montpelier, Vermont Coll.	7/ 7	29/19
VIRGINIA		
Norfolk, Old Dominion Univ.	–	52/23
Richmond, Va. Commonwealth Univ.	21/17	36/19
WASHINGTON		
Oak Harbor, Naval Hospital	5/ 4	–
Seattle, Seattle Pacific Coll.	54/33	28/18
Spokane, Gonzaga Univ.	1/ 0	6/ 2
WEST VIRGINIA		
Charleston, Morris-Harvey Coll.	3/ 3	24/18
Philippi, Alderson-Broaddus Coll.	–	3/ 2
WISCONSIN		
Appleton, Lawrence Univ.	–	4/ 2
Eau Claire, Wisconsin State Univ.	–	32/25
LaCrosse, Wisconsin State Univ.	10/10	20/15
Madison, Univ. of Wisconsin	2/ 2	–
SPECIAL MONDAY CENTERS		
CALIFORNIA		
Los Angeles, Occidental Coll.	–	2/ 1
San Francisco, Univ. of San Francisco	–	1/ 1
DISTRICT OF COLUMBIA		
Washington, Howard Univ.	–	1/ 0

Test Center	Nov. 71 (Applicants/Candidates)	May 72 (Applicants/Candidates)
IDAHO		
Boise, Boise State Coll.	–	1/ 1
OHIO		
Columbus, Ohio State Univ.	–	2/ 2
OREGON		
Portland, Univ. of Oregon	–	4/ 4
PRISONS		
CALIFORNIA		
San Pedro, U.S. Federal Correctional Institution	–	1/ 0
INDIANA		
Terre Haute, U.S. Penitentiary	2/ 2	–
MINNESOTA		
Sandstone, U.S. Fed. Penitentiary	–	1/ 0
MISSOURI		
Jefferson City, Mo. St. Penitentiary	–	6/ 0
Springfield, Medical Center for Federal Prisoners	13/ 9	–
SHIPS AT SEA		
Eight U.S. Navy ships	–	9/ 9
OVERSEAS		
BELGIUM		
Brussels, International School	1/ 0	–
Chievres, Education Center, NSSG	–	4/ 4
BERMUDA		
Paget, Department of Education	–	2/ 2
CANAL ZONE		
Balboa, Canal Zone Coll.	4/ 4	3/ 1
CUBA		
Guantanamo Bay, U.S. Naval Base	–	3/ 3
ENGLAND		
Alconbury, (USAF)	5/ 4	–
GERMANY		
Berlin, Amerika Haus Berlin	–	2/ 0
Hahn AB, Education Center	3/ 2	–
Landstuhl, Department of Army	59/25	19/19
Munich, Army Education Center	–	1/ 1
Ramstein AB, Education Center	9/ 4	–
Rhein-Main AB, USAF Dispensary	1/ 1	–
Weisbaden, USAF Hospital	9/ 5	–
Weisbaden, Lindsey Air Educ. Ctr.	–	4/ 3
Wuerzburg, Army Education Center	–	2/ 2
GUAM		
Agana, Univ. of Guam	10/ 7	–
ICELAND		
Keflavik, U.S. Naval Station	–	5/ 2
ITALY		
Brindisi, San Vity USAF Air Station	–	1/ 1
San Vito Dei Normanni, Educ. Ctr.	2/ 2	–
JAPAN		
Camp Zama, USAH Lab	–	11/11
Fukuoka City, American Cul. Ctr.	–	1/ 0
Iwakuni, Marine Corps Air Station	–	1/ 4*
KOREA		
Ku Ang Ju AB, Base Educ. Ofc.	1/ 1	–
Yongsan, USA Army Educ. Ctr.	–	3/ 3
OKINAWA		
Ryuku Islands, USA Kadena Educ. Ctr.	3/ 3	1/ 1
PEARL HARBOR		
Navy Education & Training Sup. Det.	–	11/ 0
PHILIPPINES		
Luzon, Clark AFB	11/ 3	5/10*
PUERTO RICO		
Ponce, Catholic Univ.	–	1/ 1
SICILY		
Sigonella, USNAF Sigonella	–	1/ 1
SPAIN		
Madrid, Torrejon AB (USAF)	8/ 1	–
TAIWAN		
Taipei, Education Services Ctr.	–	1/ 1
THAILAND		
U-Tupao Air Field	–	1/ 0
TURKEY		
Izmir, Education Center	2/ 2	–
VIETNAM		
Saigon, Vietnamese-American Assn.	–	1/ 1

*Extra applicants showed up on the day of the test.

(Continued from page 24.)

The second paid administration on May 5, 1973, saw 266 candidates taking the tests, out of 318 who had registered (16.4% attrition). There were 65 test centers, two of them abroad and three on ships at sea.

Statistics on numbers of tests taken by these candidates are shown in Exhibit I. Exhibit J lists the test centers.

Fewer Candidates

There has been considerable speculation about the reasons for the smaller than expected number of

candidates the second year. Had the saturation point been reached already with the 3,700 persons tested the first year? This surely was not the case, since the recent laboratory census conducted by the American Society for Medical Technology for the Center for Disease Control had found 51.8% of all personnel in the nation's 14,000 laboratories with no formal certification. These are the people for whom the Proficiency Examinations were designed.

More likely, a continuing uncertainty about specific results attainable by taking the Proficiency Examinations seemed to be responsible for the lower numbers. Such examinations are a new phenomenon. Both employers and laboratory workers need more information on how the test scores can be used in placement decisions, and more assurance that the tests are a useful and valuable tool for that purpose. Tying the Examinations into existing credentialing systems would make these points easier to realize. Efforts to achieve such tie-ins and to explain and publicize use of the tests are described in following sections.

With the smaller number of candidates, the carrying expenses of the Proficiency Examinations for Clinical Laboratory Personnel outstripped the candidates' fees, and in June 1973 ETS asked for and received permission from NCCML to cut the number of administrations to one per year. The new date is the first Saturday of March, starting with March 2, 1974.

EXHIBIT I:

1972-73 Administrations

	Dec. 2, 1972	May 5, 1973	Total
Candidates registered	193	318	511
Candidates taking tests	162	266	428
Attrition	31	52	83
Rate	16.1%	16.4%	16.2%
Test Centers	58	65	111
Candidates taking:			
Hematology	118	214	332
Clinical Chemistry	89	179	268
Blood Banking	70	166	236
Microbiology	82	183	265
Candidates taking:			
No tests	4	–	4
One test	73	77	150
Two tests	19	36	55
Three tests	16	19	35
Four tests	50	134	184

EXHIBIT J:

1972-73 Test Centers

Test Center	Dec. 72 (Applicants/	May 73 Candidates)
ALABAMA		
Birmingham, Samford Univ.	3/ 3	–
ALASKA		
College, Univ. of Alaska	–	2/ 2
ARIZONA		
Phoenix, Phoenix Coll.	1/ 1	–
ARKANSAS		
Little Rock, Univ. of Arkansas	–	2/ 1
CALIFORNIA		
Los Angeles, Univ. of Southern Cal.	5/ 4	3/ 4
San Francisco, Univ. of San Francisco	2/ 1	3/ 3
COLORADO		
Denver, Univ. of Denver	–	1/ 1
CONNECTICUT		
Hartford, Trinity Coll.	–	10/ 9
DISTRICT OF COLUMBIA		
Washington, Howard Univ.	3/ 3	9/ 6
FLORIDA		
Coral Gables, Univ. of Miami	2/ 2	2/ 2
Jacksonville, Jacksonville Univ.	2/ 2	5/ 3
Orlando, Valencia Comm. Coll.	1/ 0	–
Tampa, Univ. of South Florida	–	2/ 1
GEORGIA		
Atlanta, Emory Univ.	5/ 2	3/ 1
Columbus, Columbus Coll.	5/ 5	1/ 1
HAWAII		
Honolulu, Univ. of Hawaii	–	1/ 1
ILLINOIS		
Chicago, Roosevelt Univ.	12/ 9	11/ 7
INDIANA		
Indianapolis, Butler Univ.	1/ 0	2/ 2
Michigan City, St. Anthony Hospital	–	30/31
IOWA		
Cedar Falls, Univ. of North Iowa	1/ 1	–
Davenport, St. Ambrose Coll.	–	3/ 3
Des Moines, Drake Univ.	1/ 1	–
KANSAS		
Dodge City, Dodge City Comm. Coll.	2/ 1	1/ 1
Independence, Independence Comm. Jr. Coll.	4/ 3	–
Topeka, Washburn Univ.	1/ 1	8/ 8
KENTUCKY		
Louisville, Univ. of Louisville	1/ 0	1/ 1
LOUISIANA		
Baton Rouge, Louisiana State Univ.	2/ 1	1/ 1
MAINE		
Augusta, Univ. of Maine	7/ 6	8/ 5
Presque Isle, Univ. of Maine	–	2/ 2

Test Center	Dec. 72 (Applicants/Candidates)	May 73 (Applicants/Candidates)
MARYLAND		
Baltimore, Towson State Coll.	1/ 1	7/ 7
Salisbury, Salisbury State Coll.	–	1/ 1
MASSACHUSETTS		
Boston, Northeastern Univ.	4/ 4	11/ 9
MICHIGAN		
East Lansing, Michigan State Univ.	13/10	10/ 8
MINNESOTA		
Hibbing, Hibbing High School	–	1/ 1
Minneapolis, Univ. of Minnesota	2/ 0	5/ 3
MISSISSIPPI		
Jackson, Jackson State Coll.	1/ 1	–
MISSOURI		
St. Louis, St. Louis Univ.	5/ 3	6/ 6
Warrensburg, Central Missouri St. Univ.	1/ 1	–
MONTANA		
Helena, Carroll Coll.	1/ 1	4/ 4
Miles City, Miles Comm. Coll.	1/ 1	–
NEBRASKA		
North Platte, North Platte Jr. Coll.	–	1/ 1
Omaha, Creighton Univ.	1/ 1	–
NEVADA		
Las Vegas, Univ. of Nevada	–	1/ 1
NEW HAMPSHIRE		
Wolfeboro, Brewster Academy	1/ 1	–
NEW JERSEY		
New Brunswick, Rutgers Univ.	3/ 0	6/ 5
NEW MEXICO		
Albuquerque, Univ. of New Mexico	4/ 3	–
NEW YORK		
New York, City Coll. of N.Y.	10/ 7	–
New York, New York Univ.	–	15/12
Potsdam, State Univ. Coll.	–	1/ 1
Syracuse, Syracuse Univ.	1/ 0	6/ 6
NORTH CAROLINA		
Fayetteville, Fayetteville St. Univ.	–	1/ 1
Greensboro, Univ. of North Carolina	2/ 2	4/ 4
Plymouth, Plymouth High School	2/ 2	–
NORTH DAKOTA		
Dickinson, Dickinson State Coll.	1/ 1	–
OHIO		
Cleveland, Cuyahoga Comm. Coll.	22/22	13/ 9
Columbus, Ohio State Univ.	6/ 5	4/ 4
OKLAHOMA		
Oklahoma City, Oklahoma City Univ.	–	1/ 0
OREGON		
Lakeview, Lakeview High School	–	1/ 1
PENNSYLVANIA		
Philadelphia, Temple Univ.	15/11	46/43
Pittsburgh, Duquesne Univ.	2/ 0	17/16
RHODE ISLAND		
Warwick, Rhode Island Jr. Coll.	2/ 2	1/ 1
SOUTH CAROLINA		
Charleston, Palmer Coll.	2/ 2	1/ 1
Columbia, Univ. of South Carolina	–	1/ 1
TENNESSEE		
Knoxville, Univ. of Tennessee	3/ 2	3/ 2
Nashville, Vanderbilt Univ.	1/ 1	3/ 2
TEXAS		
Canyon, West Texas State Univ.	1/ 1	–
Dallas, Southern Methodist Univ.	6/ 6	12/10
El Paso, Univ. of Texas	1/ 0	1/ 1
Houston, Univ. of Houston	–	1/ 1
San Antonio, Ft. Sam Houston	1/ 1	–
UTAH		
Salt Lake City, Univ. of Utah	–	1/ 0
VERMONT		
Montpelier, Vermont Coll.	–	4/ 1
VIRGINIA		
Richmond, Va. Commonwealth Univ.	5/ 3	1/ 1
WASHINGTON		
Seattle, Seattle Pacific Coll.	2/ 2	4/ 2
Spokane, Gonzaga Univ.	1/ 1	–
WEST VIRGINIA		
Charleston, Morris-Harvey Coll.	–	1/ 1
WISCONSIN		
Green Bay, Univ. of Wisconsin	–	8/ 7
La Crosse, Univ. of Wisconsin	3/ 3	–
WYOMING		
Casper, Casper Coll.	–	1/ 1
SPECIAL MONDAY CENTER		
CALIFORNIA		
Los Angeles, Univ. of Southern Calif.	1/ 0	–
OVERSEAS		
GERMANY		
Landstuhl, Department of the Army	1/ 1	1/ 1
CAROLINE IS.		
Koror-Palau-West, Dept. of Education	–	2/ 2
TAIWAN		
Pacific, 374th Combat Support Group	2/ 2	–
SHIPS AT SEA		
Four U.S. Navy ships	1/ 1	3/ 3

Information Dissemination

Word about the Proficiency Examinations has been spread far and wide in the laboratory field, through articles, press releases, mailings, posters, speeches and exhibits. Dramatic proof that the message was getting through came when the number of candidates for the pilot year's tests far exceeded anticipations. Evidence is less clear now that potential candidates must pay for the Examinations and are still uncertain what difference taking the tests can mean to them.

Articles

The NCCML newsletter, GIST, carried the first detailed explanation of the Proficiency Examinations project in November 1970. Since that time, special articles have appeared in:

- *Laboratory Medicine*, published by the American Society of Clinical Pathologists
- *The Pathologist*, published by the College of American Pathologists
- *ASM News*, published by the American Society for Microbiology
- *Clinical Chemistry*, published by the American Association of Clinical Chemists
- *Lab World*, an independent journal
- *Medical Laboratory Observer*, an independent journal
- *Medical Lab*, an independent journal
- *Modern Hospital*, an independent journal for hospital administrators
- *Career Mobility Profiles*, published by the American Hospital Association
- *Comprehensive Health Services Career Development Technical Assistance Bulletin* of the National Institute for New Careers
- *Operation MEDIHC*, newsletter of the DOD-HEW-sponsored program for counseling medical corpsmen into civilian health careers
- *Manpower*, the magazine of the Manpower Administration
- NCCML's *Annual Reports* for 1970-71, 1971-72, and the *20 Year Report* published in 1973

Press releases announcing the start of the project and each of the test dates have been widely used in laboratory and other health-related publications and in the military press. Progress Reports and two larger Interim Reports on the project have gone to a mailing list of nearly 300 interested persons and organizations.

The final summation of information on the Proficiency Examinations appeared in the December 1973 GIST, with a circulation of 25,000.

Professional Meetings

The Proficiency Examinations project has been the subject of formal and informal presentations at professional meetings. The formal presentations, in chronological order, have been:

June 1971 – Albert M. Serling, who directs the College-Level Examination Program (CLEP) at Educational Testing Service, spoke about the Equivalency and Proficiency Examinations at the annual meeting of the American Society of Medical Technologists. (Relationship of the Proficiency Examinations project to tandem development of Equivalency Examinations is discussed in the next chapter.)

July 1971 – Frank J. Fornoff, Ph.D., chairman of the ETS Science Department, explained the procedures involved in developing the Proficiency Examinations at a conference on "Career Mobility" sponsored by the American Hospital Association.

October 1971 – At the ASCP Commission on Medical Technology meeting held in connection with the annual joint meeting of the American Society of Clinical Pathologists and the College of American Pathologists, a major presentation on the Proficiency and Equivalency Examinations took place. Participants were Loula Woodcock, MT(ASCP), co-chairman of the National Advisory Committee for the Proficiency Examinations; A. Wendell Musser, M.D., chairman of the National Advisory Committee for the Equivalency Examinations (and also a member of the Proficiency Examinations Advisory Committee); Jack N. Arbolino, executive director of the College-Level Examination Program, of which the Equivalency Examinations are part; and Frank J. Fornoff, Ph.D., of ETS.

October 1971 – Albert M. Serling of CLEP spoke to a Seminar on Equivalency Examinations sponsored

by the Maryland Hospital Education and Research Foundation. Jean D. Linehan, NCCML coordinator for the Proficiency Examinations project, headed a discussion task force.

November 1971 – Frank J. Fornoff, Ph.D., of ETS manned a "round table" on Equivalency and Proficiency Examinations at the annual meeting of the Association of Schools of Allied Health Professions.

December 1971 – Peter G. Loret, director of program services in the ETS California office, spoke on "Equivalency and Proficiency Examinations for Clinical Laboratory Personnel" at the American Vocational Association meeting.

February 1972 – A. Wendell Musser, M.D., spoke on "Equivalency and Proficiency Testing Related to the Medical Laboratory Field" at the meeting of the Federation of State Medical Boards.

April-June 1972 – Proficiency and Equivalency Examinations were explained to junior and senior college medical laboratory educators at a series of five regional workshops sponsored by the Board of Schools of Medical Technology. Speakers included Loula Woodcock, MT(ASCP); Clarence R. Jones, MLT(ASCP), also a member of the National Advisory Committee; and representatives of ETS.

July 1972 – A. Wendell Musser, M.D., spoke on "Equivalency and Proficiency Testing" at the national convention of the American Medical Technologists.

October 1972 – A. Wendell Musser, M.D., Frank J. Fornoff, Ph.D., of ETS, and Jean D. Linehan of NCCML described development of the Examinations at a meeting of the AMA Subcommittee on Equivalency and Proficiency Examinations, bringing together representatives of all the allied health fields then engaged in development of such examinations.

November 1972 – Jean D. Linehan of NCCML spoke on the Examinations at the 20th anniversary meeting of the Intersociety Committee on Health Laboratory Services, a group representing all agencies and organizations concerned with clinical laboratory personnel standards.

November 1972 – A. Wendell Musser, M.D., chaired a panel arranged by NCCML to discuss Proficiency and Equivalency Examinations in allied health fields at the meeting of the Association of Schools of Allied Health Professions. Other panelists were William R. Bishop, Ph.D., of the American Medical Association, Harry M. Gerlach of the College Entrance Examination Board, and Daniel R. Thomas of the American Hospital Association.

December 1972 – Clarence R. Jones, MLT(ASCP), presented to the State of Illinois Health Care Licensure Commission a paper on "Equivalency and Proficiency Testing in Relation to Licensure and Certification of Health Personnel."

October 1973 – A. Wendell Musser, M.D., and Clarence R. Jones, MLT(ASCP), spoke on "Equivalency and Proficiency Examinations," respectively, at a Training Institute sponsored by the Association of Schools of Allied Health Professions.

Informal discussions about the Proficiency Examinations have been held at other meetings attended by the Committee members and by NCCML staff, including the May 1971 HEW meeting on licensure of health personnel which led to publication of the HEW Secretary's Report to Congress on "Licensure and Related Health Personnel Credentialing"; a conference on certification of allied health personnel held by the Association of Schools of Allied Health Professions in September 1971; meetings of the National Health Council and the AMA Council on Medical Education; the First National Conference of Operation MEDIHC in March 1973; and professional meetings of pathology and related organizations.

Exhibits

A handsome exhibit entitled "Stepping Stones to Medical Laboratory Careers" was prepared and shown at a score of professional meetings to emphasize the career ladder now existing in the laboratory field, and the proficiency examinations as a way of stepping onto that ladder at an appropriate rung. The meetings where the exhibit has been shown, accompanied by NCCML staff members who have reported great interest from meeting participants, were:

October 1971 – American Society of Clinical Pathologists and College of American Pathologists

November 1971 – Association of Schools of Allied Health Professions

March 1972 – American Personnel and Guidance Association

April 1972 – National Science Teachers Association

April 1972 – American Society for Microbiology

August 1972 – American Health Congress (spon-

Judging from the material which comes to our office, the medical laboratory field is a leader among health occupations in attempting to test for proficiency rather than restrict practitioners to arbitrary (and sometimes capricious) standards.

–*Health Careers,* Maryland Hospital Education & Research Foundation (1971)

I cannot leave my discussion of medical technology affairs without mentioning the superb job done by NCCML under the leadership of Tom Peery in the development of proficiency and equivalency examinations. We have high hopes that these tests will provide employers and academic institutions with useful tools to evaluate the competency, proficiency and attainments of those returning from active military life.

—ELMER R. JENNINGS, M.D.,
President, American Society of
Clinical Pathologists (1971)

sored by the American Hospital Association and other hospital organizations)

August 1972 – American Association of Clinical Chemists

August 1972 – American Association of Blood Banks (Literature accompanied by NCCML staff, but not the exhibit, which was still in transit from the AACC meeting.)

October 1972 – National Association of Biology Teachers

February 1973 – American Personnel and Guidance Association

March-April 1973 – National Science Teachers Association

March 1973 – Association for the Advancement of Medical Instrumentation (Literature accompanied by NCCML staff, but not the exhibit, which was en route to NSTA meeting.)

May 1973 – American Society for Microbiology

July 1973 – American Association of Clinical Chemists

August 1973 – American Health Congress

Mailings

During the three and one-half years of the Proficiency Examinations Project, NCCML has developed a variety of mailing lists to reach those interested in the Examinations – employers who might use them, civilian and military laboratory workers who might benefit from them, laboratory schools which need to keep abreast of career developments, and interested individuals and organizations in other allied health fields. An important portion of the mailing list consists of organization and institution staff members who have specifically requested information about the Examinations, having learned of them through the other publicity methods used.

Six major mailings have been sent during this period – an initial letter explaining the project and five other mailings timed in anticipation of the administrations of the Proficiency Examinations. Test announcement mailings have included copies of the Bulletin of Information for candidates, posters for bulletin boards, and norming data. Separate releases, memoranda or letters went to each type of recipients. The mailing list includes:

5371 laboratories in civilian hospitals approved by the Joint Commission on Accreditation of Hospitals

1487 laboratories in additional civilian hospitals approved for reimbursement under Medicare
164 laboratories in Veterans Administration hospitals
230 laboratories in military hospitals

2440 independent laboratories approved for reimbursement under Medicare

1731 educators of medical laboratory personnel:
773 schools of medical technology
181 associate degree medical laboratory technician programs
216 certified laboratory assistant schools
105 cytotechnology schools
456 medical technology coordinators in baccalaureate degree colleges and universities

1200 organizations which have specifically requested information on Proficiency Examinations
50 state public health laboratories
120 health careers and hospital organizations
120 individuals and agencies responsible through Operation MEDIHC for counseling returning medical corpsmen on opportunities in the civilian health fields. (Nearly half are pathologists specifically appointed by ASCP to work with this effort.)
550 press list and Progress Reports list

In addition, nearly 2,500 individual laboratory workers have requested information on the examinations. These individual names were retained on the mailing list to receive at least two of the major mailings. Information also has gone to candidates from prior administrations who might tell their co-workers about the tests – or be interested in retaking the tests themselves.

There has also been a heavy flow of mail requiring individual replies. Some letters come from employers asking about possible uses of the tests in hiring or to give merit promotions and raises. Many other letters come

from laboratory workers with years of experience, often some training, and, they feel, little to show for it. They have heard that means are available for them to get some recognition, and they want information and advice.

Reaching Military Corpsmen

Several special methods have been developed to reach present and former military laboratory specialists with the information that Proficiency Examinations are now available to help them transfer their training and experience to the civilian laboratory field at an appropriate level.

Word that both Proficiency and Equivalency Examinations were being developed was included by NCCML in a brochure showing parallel military and civilian laboratory career ladders and encouraging upward movement on them.

Military laboratory directors, from those in the Surgeon Generals' offices and the Armed Forces Institute of Pathology to those in the field, have been cooperative in distributing information to some 1,750 laboratory personnel throughout the world. Press offices at the Department of Defense have assured wide use of news releases in military publications.

The DOD Transitional Manpower Program, responsible for helping military personnel nearing the end of their service, has distributed Proficiency Examinations literature before each test administration to its Transition Offices at some 500 bases in this country and abroad.

NCCML has helped to set up and staff a network of resource people who can be helpful in distributing information on the Proficiency and Equivalency Examinations in a personal way to returning military corpsmen. This network consists of more than 50 pathologists appointed by the American Society of Clinical Pathologists to work with Operation MEDIHC. MEDIHC (Military Experience Directed Into Health Careers) is a joint effort of the Department of Defense and the Department of Health, Education, and Welfare to identify medical corpsmen before their separation from the services and to counsel them into civilian health careers. Each of the ASCP-appointed pathologists has agreed to assist a state MEDIHC agency in counseling military laboratory specialists into jobs and/or further training in the civilian laboratory field. NCCML has kept these counselors informed of career developments in the laboratory field – including the Proficiency and Equivalency Examinations – through a series of intermittent memoranda.

It should be practicable for people to come into the health care system from diverse backgrounds and to demonstrate qualifications equivalent to those acquired through formal education. . . . In evaluating the individual health worker, the emphasis should be on the ability to perform necessary functions rather than formal educational accomplishments; that is, the focus should be on outputs—on worker proficiency—instead of inputs—formal course work completed. Proficiency tests are one device to accomplish this assessment.

—Final Report, Project VEHTS—Versatile Employment for Health-Trained Servicemen (1973)

Equivalency Examinations

The Proficiency Examinations for job placement were planned in tandem with a related project – development of Equivalency Examinations for academic credit in the same four clinical laboratory fields.

The Equivalency Examinations were also prepared by Educational Testing Service. They were funded by the NIH Division of Allied Health Manpower, to become part of the College-Level Examination Program (CLEP) of the College Entrance Examination Board.

The two test development projects have been coordinated through some overlap of membership on their advisory committees, through science staff members at ETS who have worked on both tests, and through NCCML publicity efforts, which have mentioned both projects and differentiated between their purposes.

NCCML staff members were instrumental in initiating the Equivalency Examinations effort, and have been involved in the project in an unofficial supportive role since it began in July 1970. The NCCML-Manpower Administration contract for the Proficiency Examinations Project included an agreement to promote *both* sets of examinations.

NCCML has pointed out before audiences and in print that the examinations differ in three ways:

- *In their specifications:* The Proficiency Examinations were developed from lists of tasks, the Equivalency Examinations from course outlines.
- *In the groups on which they were normed:* The Proficiency Examinations were normed on those working in clinical laboratories, the Equivalency Examinations on students just completing the appropriate courses.
- *In their purposes and use:* The Proficiency Examinations are for job placement, the Equivalency Examinations for academic course credit in baccalaureate Medical Technology and associate degree Medical Laboratory Technician programs.

As the only professional organization in the laboratory field specifically committed to publicizing both projects and explaining their different functions, NCCML has tried where possible to mention both projects at the same time. Actually, the concurrent development of both projects has, on balance, made it easier to explain the very different specific purposes of each one – both leading to the general mutual purpose of providing appropriate recognition and upward mobility for military laboratory specialists in particular, and laboratory workers in general.

In addition to mentioning the Equivalency Examinations in most Proficiency Examinations promotion, NCCML staff worked specifically with College Board staff on a joint brochure and a promotional mailing for the CLEP examinations in the Spring of 1973.

The Tests

There are four CLEP Equivalency Examinations in laboratory subjects: one for undergraduate Microbiology and three for the clinical subjects, Clinical Chemistry, Hematology, and Immunohematology. Each is a 90-minute paper-and-pencil test, with an optional essay test.

Like other CLEP tests, the Equivalency Examinations are given once a month at test centers across the country. The fee for taking them is $15 apiece. There are no eligibility requirements.

With the cooperation and encouragement of the Board of Schools and the American Society for Medical Technology, ETS was able to secure help from schools of medical technology and colleges across the country to norm these four examinations on several thousand students just completing the courses involved. The Board of Schools* *Newsletter* published the resulting normative data which gives the average scores achieved by

*Now National Accrediting Agency for Clinical Laboratory Sciences.

students who subsequently received "A," "B," "C," and "D" grades in the respective courses. The CLEP program generally suggests colleges award credit to candidates who score at least the average of the "C" students in the norming group.

Acceptance

Decisions on use of the test scores to grant credit are, of course, a matter for the individual colleges and universities. Other CLEP examinations are accepted for credit purposes by more than 1,400 colleges.

To learn whether laboratory educators have decided to use the tests for credit purposes, and to stimulate those still on the fence to give the matter thought, NCCML recently conducted a promotional survey on granting of credit for training/experience in the laboratory field. Questionnaires went to four types of institutions: (1) AMA-approved Schools for Certified Laboratory Assistants, (2) colleges offering associate degree Medical Laboratory Technician programs, (3) AMA-approved hospital Schools of Medical Technology, and (4) colleges or universities offering baccalaureate degree Medical Technology programs (usually in conjunction with the preceding group of hospital schools).

Returns as of January 31 indicate that at least 81 programs above CLA level now use the CLEP exams, and more than 130 are studying their use. Other preliminary survey results include the following:

Of 69 CLA schools replying, 10 have granted credit for experience to incoming students; 26 have had graduates accepted with credit in MLT or MT programs.

Of 92 AD-MLT programs replying, 49 have policies for granting credit; 34 use CLEP exams, and 31 use local tests to award credit; 27 require a demonstration of performance as well. Of 41 programs studying credit policies, 36 expect to use CLEP exams.

Of 216 MT replies, 17 grant credit and 75 are studying such policies. Eight now use the CLEP exams, 57 others expect to do so.

Of 176 colleges replying, 53 have policies for granting credit. To award credit, 39 use the CLEP tests. Of 59 colleges studying credit policies, 41 expect to use CLEP. Some also use or plan to use performance tests.

Many in the last two groups would prefer to let someone else solve the problem of granting credit. A number of MT schools say they would have to defer to the colleges on this matter. Many colleges counter by indicating this would be up to the clinical schools.

NCCML is preparing the information on present policies in directory form for publication in *Laboratory Medicine*, the ASCP monthly.

I believe that nothing should interfere with the right of an educational institution to grant its appropriate degree. But the time has come for these institutions to reconsider in depth their methods of granting credit. The institutions of higher education apparently are holding back from taking a leadership role in recognizing and utilizing equivalency examinations to grant credit for knowledge acquired in other than the formal manner. This is not only very disappointing but it is incongruous with the advances made in other fields.

—A. WENDELL MUS[illegible] M.D.,
Chairman, Equivalency Exa[illegible]tions
Advisory Committee (1973)

External Degrees

Another way in which the CLEP medical technology examinations can help laboratory workers gain appropriate credit is through the new External Degree programs offered by the the Regents of the State of New York and by Thomas A. Edison College in New Jersey. New York began in 1972 to offer an associate degree to candidates who could amass sufficient credit through courses taken at civilian and military institutions, examinations such as those of CLEP, and evaluation of life experiences. The New Jersey degree follows a similar pattern. The New York program will grant six credit hours for each of the CLEP laboratory examinations in clinical fields, and three credit hours for the CLEP Microbiology test. Candidates need not be New York residents or even come to the state to be eligible for the degree.

For laboratory workers who have CLA(ASCP) certification, who went through a full-year military laboratory course, or who have five years of varied laboratory experience, an associate degree or the equivalent is the key to upward mobility via MLT(ASCP) certification. NCCML has promoted this new opportunity, and since the New York program began, at least 21 laboratory workers have qualified for the MLT(ASCP) examination by obtaining an External Associate Degree.

Utilization

Only a few months after the Proficiency Examinations Project started, NCCML began to look ahead to ways this new tool could be used when it was ready. In November 1970, a Subcommittee on Utilization was convened, with the following members*:

Joe M. Blumberg, M.D., Major General, USA (Ret.), Co-Chairman of the Proficiency Examinations project.
Lt. Col. Robert C. Barnum, USA, MEDIHC Coordinator, Transitional Manpower Program, DOD
Lt. Col. James L. Black Jr., USMC, Educational Programs and Manpower Training, DOD
Sylvia Blatt, Chief, Division of Laboratory Improvement, Department of Health of the City of New York
Howard L. Bodily, Ph.D.,Chief, Laboratory Services, California State Health Department
Dee DePaoli, Educational Program Development Branch, NIH Division of Allied Health Manpower, HEW
Sp/6 Robert Dowell, 1st Army Area Medical Laboratory, Fort George G. Meade
Aldo J. Facca, Division of Health Standards, HEW
Donald F. Foy, Manpower Resources Branch, NIH Division of Allied Health Manpower, HEW
Marvin France, RMT, Gradwohl School, St. Louis
Harold I. Lewack, Division of Program Development and Legislative Services, Manpower Administration, DOL
Clarence R. Jones, MLT(ASCP), Faith Hospitals, St. Louis
Barbara C. Nagel, Division of Health Standards, HEW
Martha Phillips, M.S., MT(ASCP), Chief of Allied Health Training, Veterans Administration
David A. H. Roethel, Executive Director, American Association of Clinical Chemists
Wellington B. Stewart, M.D., Commissioner of Medical Technology, American Society of Clinical Pathologists
Edwin A. Williams, Veterans Employment Service, DOL

The Subcommittee considered questions of how the Proficiency Examinations could be administered, promoted and utilized to break down barriers to upward mobility for laboratory workers. Participants suggested that use of the Examinations by employers to hire and place personnel could be enhanced and encouraged by working to tie the tests in with existing credentialing structures – certification, licensure, and governmental personnel qualifications under civil service and Medicare regulations. NCCML efforts since that meeting have followed these suggestions, with some successes and some failures, as noted in the sections which follow.

*Titles are those held at that time.

Endorsements

NCCML asked the major professional associations of laboratory employers in 1971 to endorse use of the Proficiency Examinations for job placement purposes, and all of them have done so: the American Society of Clinical Pathologists, the College of American Pathologists, the American Academy of Microbiology, the American Association of Clinical Chemists, the American Association of Blood Banks, and the American Hospital Association.

Certification

Laboratory workers who complete training programs accredited by the American Medical Association can obtain national certification through the Board of Registry of the American Society of Clinical Pathologists. More than 120,000 of them have been examined and certified by this group since 1928. There are three certifiable levels of laboratory generalists:

Certified Laboratory Assistant – CLA(ASCP) – with one year of post-high school vocational laboratory training or with training and experience in the military laboratory system.
Medical Laboratory Technician – MLT(ASCP) – an associate degree level, requiring two years of college credit plus or including laboratory training (civilian or military) and/or experience.

Medical Technologist – MT(ASCP) – the baccalaureate degree level, including AMA-approved year-long clinical training or five years of laboratory experience.

In more recent years, two other registries for laboratory personnel have evolved. These are independently organized, largely serve the military, commercial school and on-the-job trainees. They are sponsored by the American Medical Technologists and the International Society of Clinical Laboratory Technologists.

It was not the purpose of the Manpower Administration to provide a new way to certification by a professional group for those who lacked this credential. The Proficiency Examinations stand on their own as a tool for job placement without such a tie-in. But as pointed out from the start by members of the Subcommittee on Utilization, understanding and use of the Examinations by employers would be increased if the tests were in some way related to existing credentialing systems. NCCML has therefore presented this possibility to the appropriate bodies.

No relationship between the Proficiency Examinations and the certification system has been achieved. Yet the existence of the Examinations has served to encourage provision of alternate pathways for certification of experienced laboratory workers who lack formal training requirements but who can prove they have the necessary job knowledge and capabilities.

The Board of Directors of the American Society of Clinical Pathologists instructed its Board of Registry in August 1971 "to explore the possibility of using proficiency examinations and equivalency examinations to qualify personnel to take Registry examinations." The Board of Registry and the CLA and MLT Committees have discussed such use of the Proficiency Examinations for Clinical Laboratory Personnel on several occasions.

A major problem in relating the Proficiency Examinations to ASCP certification appears to be the level of the tests. The Examinations were designed to "evaluate the job-related skills and knowledge necessary for a laboratory technician" within a rather wide range above the assistant level and below that of the Medical Technologist, as discussed earlier. This is the level where the tests can be most useful in their prime purpose of identifying skills of former military laboratory specialists and experienced civilians trained on the job.

While they thus would appear to relate to the job level of the MLT(ASCP), there is a two-year college requirement for certification at that level which neither the Board of Registry nor the MLT Committee wishes to waive or supersede at this time. The Board of Registry was willing in July 1972 to accept an experimental trial of the Examinations in lieu of the laboratory training component of MLT(ASCP) eligibility, but the MLT Committee did not concur, and the matter was dropped.

The possibility of relating the Proficiency Examinations to the Certified Laboratory Assistant level has been discussed during the past two years. This level of certification is already available to former military corpsmen, but there has been no alternative to formal CLA training for civilian laboratory workers wishing to qualify. The Board of Registry in July 1972 voted to open the CLA(ASCP) examination to candidates lacking

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(We recommend) that employers, both private and public, hire and promote on the basis of talent alone as well as on prior certification. This will require better tests of talent, more exercise of individual judgment by employers and their representatives, more training opportunities on the job, and more concern for ladders to rise and less with ceilings based on prior certification. The best test is performance on the job. . . . Greater reliance by employers on tests developed to screen applicants for positions would be vastly less costly to society. . . .

–*Less Time, More Options,* Carnegie Commission on Higher Education (1971)

Professional associations and licensing and credentialing bodies should remove unnecessary, purely formalistic obstacles from the paths of those striving to progress from lower to higher levels of knowledge and skill within the same general specialty area. Adequate account should be taken of what has been learned through non-traditional educational forms and by experience. . . .

–AMA Council on Medical Education (1973)

> The Department encourages the development of meaningful equivalency and proficiency examinations in appropriate categories of health personnel for entry into educational programs and occupational positions. The States are called upon to assist in the implementation of this effort by amending licensing laws, where necessary, that will recognize such examinations for purposes of granting advanced educational or job placement.
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> *—HEW Report on Licensure and Related Health Personnel Credentialing* (1971)

formal training requirements who could meet acceptable scores on all four Proficiency Examinations. Announcement of this decision produced considerable interest among civilian laboratory personnel.

NCCML and ETS made available to the Board and the CLA Committee the Examination scores of several hundred candidates who could be identified as CLA's. Many of them had not taken all four tests, however, and removing these from the list resulted in very small populations from which to make statistical generalizations. The average scores of these CLA's who took all four Proficiency Examinations were as follows:

	Form A (*57 candidates*)	*Form B* (*71 candidates*)
Clinical Chemistry	26.5	24.0
Microbiology	28.5	28.7
Hematology	41.1	40.8
Blood Banking	26.5	29.0

NCCML and ETS also arranged for the CLA Committee members to review the test booklets at their meeting in July 1973. Comments indicated there was need for updating (a subject which will be treated in a subsequent section of this report), and that some areas covered by the tests are not included in some CLA training programs. The Committee agreed to study various alternate pathways to CLA(ASCP) certification in order to recommend a more flexible approach to the Board of Registry for its approval.

Thus while NCCML failed in efforts to gain a formal tie-in of the Proficiency Examinations with the certification system, there is promise for adoption of some other method to recognize experienced laboratory workers, at least at the lowest level.

Licensure

Ten states, Puerto Rico, and the City of New York now license laboratory personnel below the level of the director. Several states include standards for personnel in their regulations for licensing clinical laboratories. The effect generally is the same: to require certain education and experience of anyone wishing to work in a laboratory. Legislation affecting laboratory personnel standards is perennially under consideration in other states, but has been curtailed for several years following a call by the American Medical Association and the American Hospital Association for a moratorium on additional licensure.

That moratorium was endorsed by Elliot L. Richardson, then Secretary of Health, Education, and Welfare, in his August 1971 "Report on Licensure and Related Health Personnel Credentialing." In that influential report, Secretary Richardson said HEW "encourages the development of meaningful equivalency and proficiency examinations in appropriate categories of health personnel for entry into educational programs and occupational positions." The report recommended that state licensing bodies use such examinations as an alternative to education or experience requirements.

A similar recommendation was made in a 1972 report on "Occupational Licensing and Public Policy," prepared for the Manpower Administration and later published by Public Affairs Press. Principal author of this report was Benjamin Shimberg, director of occupational programs for Educational Testing Service. The report credits NCCML with helping "to create a climate favorable to equivalency and proficiency testing" in the health field.

NCCML has kept state licensing agencies informed during development of the Proficiency Examinations for Clinical Laboratory Personnel. Several such agencies have shown interest in using the Examinations in their licensing processes.

Tennessee was the first to make use of the Proficiency Examinations, originally for ex-military corpsmen and later for all experienced laboratory workers seeking to qualify for technician licensing in the State. The Laboratory Licensing Service announced in February 1973 that candidates may qualify for the State's technician licensing examinations in any of the four fields in which they take the Proficiency Examina-

tions and meet the average score of NCCML's norming groups. The Service has arranged to administer the Examinations for this purpose three times a year, under ETS direction, for the convenience of prospective licensees.

Nevada's Bureau of Laboratories and Research informed NCCML in December 1973 that its Advisory Committee is in favor of adopting the Proficiency Examinations "as a means of qualifying technologists for certification in Nevada."

The Montana Department of Health and Environmental Sciences is committed to using the Examinations in lieu of developing their own tests under licensure legislation now pending.

Licensing committees in New York City and in Georgia have asked to review the Examinations, and arrangements have been made for them to do so. The Laboratory Advisory Committee in Hawaii has expressed interest in use of the Proficiency Examinations. Pennsylvania, Michigan and Florida officials have also inquired about use of the Examinations in licensing laboratories and workers.

Civil Service

Federal, state and local civil service agencies may consider use of the Proficiency Examinations to qualify personnel.

Under Federal regulations, higher level positions are open only to those with formal training and experience requirements. A military laboratory specialist coming from a supervisory position in an Armed Forces laboratory cannot obtain a similar position in the U.S. Civil Service laboratory system.

As director of a clinical laboratory, I endorse this concept of proficiency testing for individuals who receive laboratory technician training in other than the AMA-approved technician and technologists programs. We may well decide to require such testing of job applicants for these positions if they have not had the formal academic training in these fields.

—MICHAEL L. O'CONNOR, M.D., The University of Iowa (1972)

The evidence continues to mount—in the health fields and in general education—to the point that in almost every area the question is not whether proficiency and equivalency measurements can be made, but how sincere you are in really wanting to do the job.

—*Pathways to Health Careers,* Health Careers Council of Illinois (1972)

Officials of the Standards Division of the U.S. Civil Service Commission have said Proficiency Examinations scores could be used within present regulations. According to Leon H. Blumenthal, Chief of the Science and Engineering Occupations Section, "The results of such examinations would be a useful measure of the qualifications of candidates for clinical laboratory positions."

State and local civil service agencies have been informed of the Proficiency Examinations by the Bureau of Intergovernmental Personnel Programs of the U.S. Civil Service Commission, which recommended to regional and state offices:

> We think that the professional groups supporting this endeavor are to be commended for promoting this innovative but sound alternative to an absolute educational requirement as the basis for entry to higher level laboratory positions. It occurs to us that you might find this testing program useful in one or more of several ways, such as an alternative way of meeting minimum qualifications, a rated part of an examination, or a significant part of qualifications evidence provided to appointing officials.

NCCML has informed agencies of this possibility, but has not pursued it individually with any of them.

Medicare

For reimbursement under the Medicare program, providers of health services must meet various Federal requirements. Among these are regulations establishing certain standards or qualifications for health care personnel.

In the case of clinical laboratories, three different sets of regulations pertain. Hospitals accredited by the Joint Commission on the Accreditation of Hospitals (JCAH) are presently accepted for Medicare reimbursement, and

the JCAH standards for laboratory personnel do not spell out detailed educational or experience qualifications. Other hospitals are directly regulated by Medicare, again with no specific rules regarding the qualifications of laboratory personnel. Nearly 2,500 independent clinical laboratories, however, come under a third set of Medicare regulations which do specify certain education and experience for laboratory technologists and technicians. There is pressure to extend these independent laboratory regulations to hospitals,but this has not been done to date.

Since an initial impetus for the Proficiency Examinations Project was the interest of the House Ways and Means Committee in providing alternate ways for laboratory technicians to qualify under Medicare's personnel standards for independent laboratories, NCCML has kept in touch throughout the project with the HEW Division of Medical Care Standards, the office charged with developing those standards. Division staff members attended the meeting of the project's Subcommittee on Utilization and several meetings of the National Advisory Committee. Special meetings with Division staff have been held to keep them informed on the status of the project.

Meanwhile, mandates for Medicare to use proficiency examinations as an alternate way to qualify laboratory personnel have grown from interest on the part of the Ways and Means Committee into a requirement of law.

In 1970, the Committee asked the Division of Medical Care Standards to consult "with appropriate professional health organizations and education institutions to develop proficiency testing and educational equivalency mechanisms for use in determining the qualifications of laboratory personnel under the Medicare program." The Division reported in 1971 on both developing testing projects, and indicated that "the proficiency examinations . . . have more immediate potential for application to the Medicare program. . . ."

In new regulations for independent laboratories it drafted in 1970, the Division included a provision whereby those technical personnel who do not meet formal training and experience requirements may prove they are qualified if they "successfully participate in proficiency and/or equivalency examinations when these examinations are available and approved by the Secretary." Although these regulations have not yet been adopted, for a number of reasons unrelated to this report, there has been no question about that new section providing workers with alternate ways of qualifying.

Congress gave the mandate the force of law in H.R. 1, the Social Security Amendments of 1972 (P.L. 92-603), directing HEW to provide – unitl December 31, 1977 – proficiency examinations as an alternate qualifying mechanism for all categories of health personnel regulated under Medicare. HEW is now having a whole series of proficiency examinations developed to meet this requirement, including tests for clinical laboratory technologists and cytotechnologists. These projects are outlined in a subsequent section of this report.

EXHIBIT K:

Norming Data for Medicare

The following data summarize the preformance of 1,061 Medicare-qualified laboratory technicians on the Proficiency Examinations for Clinical Laboratory Personnel.

Form A was given in July 1971, November 1971 and December 1972. Of 465 candidates whose scores are summarized below, 114 were CLA-trained (qualifying under Section 405:1315(d)(1)) and 351 were military-trained (qualifying under 405:1315(d)(3)).

Form B was given in July 1971 and May 1972. Of 596 candidates whose scores are summarized below, 232 were CLA-trained and 364 were military-trained.

	Form A		Form B	
CLINICAL CHEMISTRY				
Number		376		507
CLA-trained	71		210	
Military-trained	305		297	
Mean		34.39		29.14
Standard Deviation		13.08		11.25
MICROBIOLOGY				
Number		365		479
CLA-trained	70		191	
Military-trained	295		288	
Mean		42.97		35.46
Standard Deviation		14.94		14.54
HEMATOLOGY				
Number		415		546
CLA-trained	92		229	
Military-trained	323		317	
Mean		44.76		43.14
Standard Deviation		11.13		9.75
BLOOD BANKING				
Number		368		486
CLA-trained	80		206	
Military-trained	288		280	
Mean		34.54		32.55
Standard Deviation		13.77		12.01

Meanwhile, Proficiency Examinations for Clinical Laboratory Personnel – for laboratory technicians – now exist. NCCML and ETS and the HEW Division of Medical Care Standards have met and corresponded for more than a year in an effort to establish whether these *NCCML Examinations are* appropriate for Medicare purposes in qualifying laboratory technicians as required under P.L. 92-603. To date, no decision has been made.

Last spring, it was agreed that the Division would convene an outside panel to advise on the appropriateness of NCCML's Proficiency Examinations for its purpose. For this panel, the Division requested a statement on how the Examinations were developed, along with appropriate norming data vis-a-vis Medicare standards. NCCML and ETS compiled this information in July 1973 in the form of a 52-page memorandum including details of test development procedure, lists of laboratory experts involved, content outlines, and other test specifications. Also included were analyses of the test scores of 1,061 candidates who qualify under Medicare's present regulations for laboratory "technicians." Of these candidates, 346 were qualified under Section 405:1315(d)(1), through training as Certified Laboratory Assistants. The other 715 qualified under Section 405:1315(d)(3), as trained and experience military laboratory specialists. Their scores are shown in Exhibit K.

The Division also requested that the tests themselves be made available for review at a meeting of the advisory panel. ETS has arranged to make this possible. Both NCCML and ETS have also indicated willingness to invite as resource persons for that meeting testing experts, members of the Examining Committees, or members of the project's National Advisory Committee, as the Division staff thinks appropriate.

The Division has not yet convened an advisory panel. Division staff have met with the Manpower Administration project officer to discuss the legalities of a request from HEW to DOL for use of the Examinations, should they be deemed acceptable for Medicare. Federal government ownership of the Examinations makes such usage possible.

But the question of Medicare's use of the Proficiency Examinations for Clinical Laboratory Personnel as an alternate way of qualifying laboratory technicians is still unresolved.

Special Evaluations

The Proficiency Examinations can serve numerous other innovative purposes.

Leaders of two laboratory training programs are using the Examinations as one means of *evaluating those programs.* The University of Alabama is using the tests as a measure of student achievement in its experimental HEW-funded technical training project, in which high school graduates and students who have completed a year of junior college are given a year of laboratory training, on completion of which the former are CLA-eligible and the latter receive the AD-MLT from their colleges.

At the Lakeshore Medical Laboratory Training Programs in Michigan City, Indiana, Educational Coordinator Ellen Firme, MT(ASCP), has had CLA students take the Proficiency Examinations, and is now using the Examinations as a pre-test in a new special program training experienced but uncredentialed workers as CLA's.

The tests can also be used as a diagnostic tool to identify individual needs of laboratory workers for *continuing education.* NCCML is trying this approach in its Labor Department-sponsored program to upgrade the skills of laboratory workers in Indian Health Service hospitals in Arizona. Workers participating in the project have taken the Proficiency Examinations in a specially-arranged administration, and individualized study and tutorial programs have been designed for each of them based on their scores. The materials used in this continuing education project are a comprehensive set of

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One thing the Proficiency Examinations scores have accomplished is to show that the military are better lab technicians than they thought they were, that they are superior in many areas. Any lab worker, military or civilian, by taking the Proficiency Examinations can discover where his strengths and weaknesses lie. In hiring, I always look first at references from former employers for professional experience and ability to get along with people, but I also like to see Proficiency Examinations scores as a part of a general evaluation.

–ROBERT REID, Hematology Supervisor, Washington (D.C.) Hospital Center (1972)

I encourage all competent technicians to take the Proficiency Examinations because any good scores on their record are a plus, especially for those trained on the job and with no professional certification.

—PRISCILLA CARLSON, Hematology Supervisor, Suburban Hospital, Bethesda, Md. (1972)

I am in complete accord with the concept of career mobility and believe that the Proficiency Examinations will be very useful to me in this regard.

—JOHN G. ETHERIDGE, M.D. Coliseum Park Hospital, Macon, Ga. (1974)

I saw one of your bulletins and had to write you and sing your praises. I have personally wished for something on this order for years.

—JANE SABES, MT(ASCP), Chief Lab Tech, Johnson County Memorial Hospital, Cleburne, Texas (1972)

This seems to me to be the way to provide upward mobility for laboratory workers, which is a very desirable thing to have.

—HELEN KITTSLEY, Assistant to the Dean, University of Wisconsin—Milwaukee (1972)

I think this is a grand opportunity for those caught in the "education gap."

—DOROTHY MILLER, M.T., St. Luke's Hospital Laboratory, Bethlehem, Pa. (1973)

audio-taped lectures with slides called "Listen, Look and Learn," also developed by NCCML under contract with the Labor Department.

State health departments and voluntary agencies interested in improving laboratory performance in a number of other areas have begun making plans for similar use of the Proficiency Examinations in their own continuing education projects.

The Proficiency Examinations can have a role in *rehabilitation of prisoners.* MDTA-supported laboratory training is available in the Federal Bureau of Prisons' Medical Center in Springfield, Mo., and inmates there have taken the Proficiency Examinations. In cooperation with the training director at Springfield, NCCML has attempted to assist in finding job opportunities for several of these trainees about to be paroled, but the tightening of the job market has made this difficult to achieve.

There are other laboratory workers in prison hospitals around the country who have been trained on the job, and under the newly-enacted Comprehensive Employment and Training Act of 1973, it may be possible that payment of test fees can be authorized either under Title I, Sec. 101, or Title III, Sec. 301.

Another possible use of the Proficiency Examinations is to measure the job competency of *foreign-trained laboratory workers* who wish to come to the United States to work. A graduate in medical technology from a foreign university is not eligible to become a certified medical technologist in this country unless he takes a year-long course in an AMA-approved school. To apply to such a school, he must have Board of Schools approval of his college transcript, and then must find a school willing to accept him. Most schools of medical technology today have more applicants than they can accept, and they can fill their classes without taking on the extra problems that accepting a foreigner may entail.

Those wanting to come from abroad might find job placement here through the Proficiency Examinations route – if their English is sufficient for a paper-and-pencil test. While ETS can only arrange a test center overseas for military laboratory specialists, once such a center is set up on a military base it will also accept civilians who wish to take the tests. NCCML has had considerable correspondence with foreign laboratory workers, particularly in the Far East, about this.

While the present job scarcity in some areas of the country makes this opportunity less hopeful for foreign-trained laboratory workers today, it could nonetheless be a possibility for the future.

Follow-up Study

Proficiency examinations provide "a short circuit to advance deserving workers lacking the necessary educational qualifications up through the ranks without professional accreditation."

Reactions like this one from Dr. Simon Russi, director of laboratories at Petersburg (Va.) General Hospital, from other employers and supervisors, and from laboratory workers themselves, came in a survey made after the first examinations.

Dr. Russi gave raises to three technicians after the examinations.

"Because I teach at the Medical College of Virginia, I am able to evaluate their capabilities myself," Dr. Russi explains. "But as an administrator, I need an outside yardstick. The proficiency examinations have provided me with such an objective conformation."

Sharon Foreman at Prince Georges General Hospital in Maryland worked for eight years without academic credentials before taking the Blood Banking and Hematology proficiency exams.

"I showed my scores to my supervisor who was sufficiently impressed to give me a merit raise and I am now Blood Bank Supervisor," she reports. "I think the proficiency exams are doing a terrific job in helping people get ahead on the basis of their job experience."

M/Sgt. Gerald W. King is in the Chemistry Section of Andrews Air Force Base Clinical Laboratory. He took all four tests in May 1972.

"When I get out of the Air Force," he said later, "I hope to put the scores to use in getting a civilian job."

Martha DeMarcky, chief medical technologist at Dover, N.J., General Hospital, encouraged three of her laboratory workers who had been trained on the job to take the proficiency tests.

"Our girls did very well," she reports. "All three attend college, and their good scores gave them renewed self-confidence to continue toward their degrees. As for us, we were glad to have the assurance that our training was measuring up."

The Proficiency Examinations must prove themselves in practice as useful tools in making employment decisions.

To gain an understanding of the actual employment experiences of some of the candidates who had taken the tests, NCCML and ETS conducted a telephone follow-up study of candidates who took the Examinations in the pilot 1971-72 year, asking why they did so, what they thought of the tests, and what if any result they had achieved through use of their scores.

The survey confirmed expectations. The average candidate had taken the tests out of curiosity ("just tc see how I would measure up"); thought they were good tests, if somewhat difficult; and didn't do anything with the scores.

Specifically, the results of the survey were as follows:

A total of 277 candidates living in California, the District of Columbia, Illinois, Indiana, Iowa, Maryland, Michigan, New Jersey, New York, Pennsylvania and Virginia were interviewed. Many others were no longer at the same address less than a year later. Some may have been in the military.

Of those who cited reasons for taking the test, 154 (58.3%) indicated curiosity, 49 (18.5%) said a supervisor or instructor had asked or suggested they take the tests, and 61 (23.1%) did so with a hope of upgrading, now or in the future. Some few were under the mistaken impression these tests were soon to be required, so they might as well get it over with. Another handful thought they would gain academic credit by taking them. Others were in training or retraining programs and wanted to assess their progress, or to have some practice for a forthcoming certifying examination. Some were supervisors who were urging others to take the tests and so became candidates themselves in order to know what the tests contained.

Comments on the tests themselves were generally favorable. Asked what they thought of the tests, 173 (84.4%) expressed positive opinions (of these, 23 were

I urged some of my students preparing for the Registry exam in Medical Technology to take the Proficiency Examinations. They then studied especially hard in the areas where the Exams showed up their weaknesses, and they all passed the Registry exam.

—JAY M. PRICE, VA Hospital, Washington, D.C. (1972)

The scores of the lab technician here who took two of the Proficiency Examinations have been made a part of her permanent record. When a personnel salary review comes up they will be a valuable measure of her capabilities and will certainly be taken into consideration.

—JAMES M. HARDEE, MT(ASCP), Administrative Officer, Hunter Laboratories, Washington, D.C. (1972)

classified by the pollers as "extremely positive"), and 32 (15.6%) expressed negative opinions. While 68 found the tests difficult and 18 found them easy, there was no attempt to correlate these opinions with job experience or test scores. Some few felt the tests were too theoretical; others said they were too practical, and ability to answer would depend on the type and size lab one worked in.

Consistent with their "just to see" purpose in taking the tests, most candidates – 122 (59.5%) – didn't try to do anything with their scores. Of the 83 (40.5%) who did show the scores to a supervisor, 61 received no response at all. The "positive" responses of the other 23 supervisors ranged from a smile to a pat on the back to a few promotions and raises. Comments pointed up the need for more information both for employers and employees. It was clear that while many supervisors may have urged their employees to take the Proficiency Examinations, many others had never heard of the tests or had no idea what to make of the scores. Candidates themselves were confused about what their scores meant, and NCCML's subsequent efforts to present the norming information bore that in mind.

Presumably, similar interviews with candidates who paid to take the tests might reveal a different pattern of purposes and results. Attempts were later made to reach December 1972 candidates in the same geographic locations, but the number of telephone contacts was very small. Of 24 interviewed, 9 took the tests out of curiosity, 8 because of a supervisor's recommendation, and 7 with the hope of upgrading. Fifteen commented positively about the tests, and only one negatively. Ten had done nothing with their scores; of 13 who had showed the scores to a supervisor, only three had a positive response. Thus while the candidates' purposes seemed to have changed with the imposition of a $25 fee, the opinion of the tests continued to be favorable, and it was still evident that there was no certainty as to what could be achieved with the test scores.

This telephone survey was originally conceived as a trial run for a more thorough questionaire follow-up of all candidates and their supervisors, correlating both opinions and individuals' progress up the career ladder with the test scores and other variables. When it was learned that few candidates could yet point to objective results from taking the tests, despite their favorable attitude toward them, the decision was made to concentrate efforts on filling the need for information instead. A comprehensive follow-up study could be very enlightening.

Equal Employment Mandates

A new impetus for use of job-related proficiency examinations to qualify workers for employment in all fields is the current national movement for equal job opportunity. Court decisions and Federal, state and local laws have outlawed discrimination in employment on account of race, color, religion, sex, or national origin. All employment practices are now under scrutiny to see whether they in fact have the effect of discriminating, whatever their intention.

Requirements for selection and promotion of personnel have come under successful attack in the courts. In the landmark case, *Griggs v. Duke Power Co.*, the Supreme Court ruled that employers who rely on intelligence and aptitude tests – or, by implication, on high school diplomas or other academic qualifications – may be guilty of discrimination under the 1964 Civil Rights Act, unless they can prove their requirements are specifically related to job performance. Chief Justice Warren Burger, writing the Court's unanimous opinion, said employers must "measure the person for the job and not the person in the abstract."

Several sets of Federal rules for assuring that employment tests are job-related have been promulgated. They are now being revised into a uniform set of regulations which will apply under all the various Federal mandates prohibiting discrimination in employment.

The Proficiency Examinations for Clinical Laboratory Personnel were carefully designed to test the skills and knowledge necessary to perform the functions of a laboratory technician. The opinion of those who have seen the tests is that they appear to do just that. But it remains to be proven that higher scores on the Proficiency Examinations correlate with better performance on the job. Such a study should be undertaken, using sophisticated techniques, to assure that these Examinations can provide the useful tool for employers it was intended they should be.

. . . Properly validated and standardized employee selection procedures can significantly contribute to the implementation of nondiscriminatory personnel policies. . . . Professionally developed tests, when used in conjunction with other tools of personnel assessment and complemented by sound programs of job design, may significantly aid in the development and maintenance of an efficient work force and, indeed, aid in the utilization and conservation of human resources generally.

—*Guidelines on Employee Selection Procedures,* Equal Employment Opportunity Commission (1970)

Other Allied Health Fields

The model established by NCCML and the Labor Department in developing proficiency examinations has now been followed in other allied health fields.

In a speech before a subcommittee of the DOL National Manpower Advisory Committee in June 1972, Thomas J. Hatch, director of the HEW Division of Allied Health Manpower, applauded the Manpower Administration for leading the way in the complex and difficult effort to determine what constitutes proficiency in a health occupation. Credentialing, he said, "acts as a barrier to career development for substantial numbers of persons, many of whom are presumed to be competent in their field."

HEW has begun a number of proficiency examinations projects, working with allied health organizations and testing agencies, and stimulated by two Congressional mandates.

In the Health Training Improvement Act of 1970 (P.L. 91-519), HEW was authorized to develop proficiency examinations to recognize previously acquired training or experience in the allied health fields. And in P.L. 92-603, the Social Security Amendments of 1972, HEW was directed to provide proficiency examinations as an alternate qualifying mechanism for health personnel regulated under Medicare.

The Division of Allied Health Manpower, with responsibility under the former law, and the Division of Medical Care Standards, with responsibility under the latter, worked out an agreement to coordinate efforts and avoid duplication in developing and administering tests for workers "seeking recognition of their competence to practice for purposes of meeting employment requirements, professional recognition, and/or participation in government-sponsored reimbursement programs."

The two Divisions agreed that development of such proficiency examinations should generally proceed in three phases: "(1) preparation of the framework of essential knowledge and skills related to performance requirements, (2) development of appropriate tests and procedures applicable to job levels within the discipline, and (3) administering such tests to individuals seeking recognition of their competence. . . ."

Proficiency examinations projects for allied health workers are in various stages. Those contracted with the Division of Allied Health Manpower are as follows:

1. *Physician Assistant.* A test prepared by the National Board of Medical Examiners was given in a norming administration in December 1973 to candidates who have graduated from formal training programs. Eligibility for future administrations will be broadened to include those trained on the job.

2. *Occupational Therapy.* Following a phase I contract in which the American Occupational Therapy Association developed skills and knowledge requirements, the Professional Examination Service of New York City is developing tests for two levels comparable to the assistant and the therapist. Completion is expected by summer.

3. *Radiologic Technologist/Technician.* Educational Testing Service, contractor for both of the first two phases, is now pretesting an examination expected to be ready by summer.

4. *Respiratory Therapy.* Following a phase I contract with the American Association of Respiratory Therapy, the Psychological Corporation of New York City is developing tests for two levels comparable to the technician and the therapist. Completion is expected by summer.

5. *Medical Record Personnel.* The American Medical Record Association is at work on phase I, expected to be completed by the end of 1974, after which bids will be sought for test development.

The Division of Medical Care Standards is sponsoring contracts in the following fields:

6. *Clinical Laboratory Technologist.* Professional Examination Service has contracted for phases I and

2, and a completed examination is expected to be ready by the end of 1974.

7. *Cytotechnologist.* Professional Examination Service has contracted for phases 1 and 2, and a completed examination is expected to be ready by the end of 1974.

8. *Licensed Practical Nurse.* The National League for Nursing has developed a test for waivered LPN's. It was given to 2,260 candidates in September 1973, and preparations are being made for 10,000 candidates for the second administration this April.

9. *Physical Therapist.* A test to qualify state licensed physical therapists without full professional training for Medicare participation was developed in 1970 by Cybern Education Inc. The test is being administered annually by the Psychological Corporation; there were 59 candidates in December 1973.

One additional proficiency testing project is underway through the HEW Division of Health Services Design and Development, a research project unrelated to the mandates described above:

10. *Emergency Medical Technicians.* The University of Alabama School of Community and Allied Health Resources has developed a proficiency examination which ultimately could be useful in licensing and certification of emergency medical technicians. The project is now gathering normative information and doing statistical analyses.

Future Needs

Three problems regarding the Proficiency Examinations for Clinical laboratory Personnel remain as Contract #82-22-70-35 draws to its close:

1. The Examinations will soon need to be updated, since the clinical laboratory field is an ever-changing one.
2. It is not possible for candidates' fees to cover more than the cost of administering and scoring the tests. Thus there is no provision for publicizing the Examinations in the future.
3. A study to compare job performance with test scores will be necessary to prove the Examinations are job-related under the mandates of equal employment opportunity regulations.

Two possibilities for accomplishing these ends remain.

One lies in the intention of Medicare officials to ask an advisory panel to rule on the possible use of the Proficiency Examinations to qualify laboratory technicians under Medicare regulations, as required by P.L. 93-603. An affirmative decision would necessarily commit Medicare to update the Examinations and publicize their availability. And proof of the job-relatedness of Medicare's examinations is certain to be required in the future.

Another opportunity lies in the recent decision of the Board of Directors of the American Society of Clinical Pathologists that the Society should seek to do a study of the job-relatedness of the Proficiency Examinations for Clinical Laboratory Personnel. Such an interest might lead to a related interest in updating and promoting the Examinations.